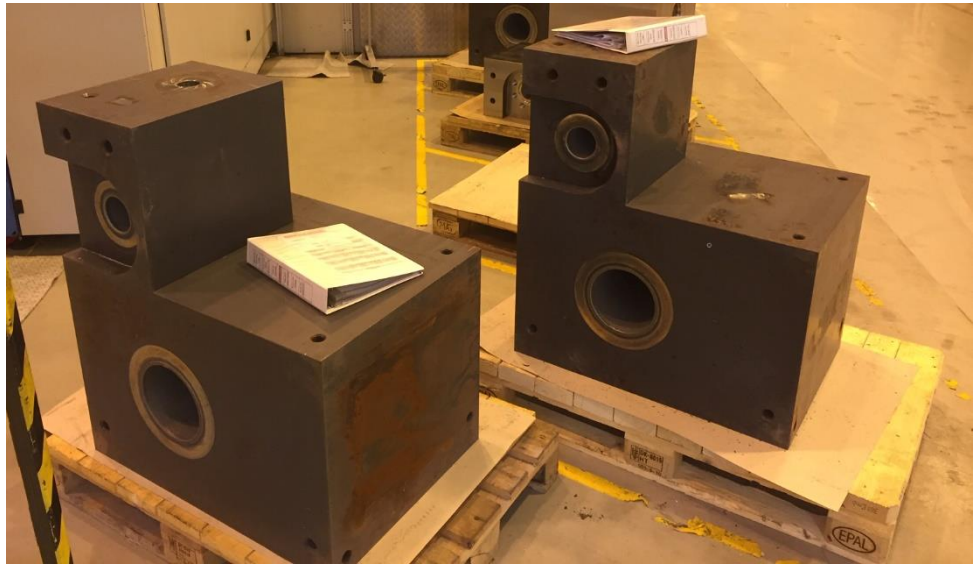
# Improvement project | Reducing «Missing documentation» when receiving goods

## Content of this Storyboard:

1. Executive summary
2. Project tools
3. Documentation of the DMAIC phases
4. Appendix: Detailed analysis



*When goods are received in the warehouse, a defined set of documentation shall accompany the goods. The required documentation is often insufficient or missing.*

# 1) Executive summary | Working method, problem statement and root cause analysis

## Working method

- This improvement project is following the DMAIC process for problem solving defined in our company.
- A team with experienced personnel has been systematically working with this problem over a 9 months period.
- Relevant facts have been collected, affected processes analyzed and involved departments and personnel interviewed, all to increase the likelihood of finding and fixing the root causes of this problem.

## Problem statement

When goods are received in the warehouse, a defined set of documentation shall accompany the goods. The required documentation is insufficient or missing in 18% of all goods received. This leads to:

- Generation of a “Missing Documentation NCR” for each item.
- A lot of man-hours used for handling these NCRs.
- Material without proper documentation are put on “Blocked Stock” however an emergency procedure called “Temporary release” is used to free the material, this leads to a quality and HSE risk in our production.

## Baseline vs. Project goals

| Prioritized variables from key stakeholders * | Current performance | Project goals (12 months) | Actual achieved |
|---|---|---|---|
| Material with missing documentation received in the Warehouse (Numbers per year in parenthesis) | 18% (3.348) | 13% (2.500) | |
| Cost related to man-hours handling the NCRs (measured by Finance) | MNOK 12,8 | MNOK 5,0 | |
| Average days of closing a Missing Documentation NCR (average last 12 months) | 68 days | 20 days | |
| Number of employees involved in the NCR closing process | 5,1 | 2 | |
| Use of “Temporary Release” on Blocked Stock items. | 25,1% | 5% | |

## Root cause analysis (conclusions)

| No | Description | In scope? |
|---|---|---|
| 1 | Global procedure QA10000222919 requires immediately update of an NCR if documentation is missing. As 63% of all missing docs are fixed within 72 hours, a “grace period” of 72 hours is included in an update in the procedure. | Yes |
| 2 | QS cannot approve documents in DTS (Supplier documentation system). Improve workflow in DTS incl. a new document type. | Yes |
| 3 | SDRL and administrative requirements are contradicting. Align these requirements. | Yes |
| 4 | Suppliers are ignoring / not following contract requirements. No unit in the company has the responsibility of following up financial consequences. | No |
| 5 | Documentation requirements for products are different from project to project. No Product Management unit exist for key products. | No |

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## Project tools included:

1. Team roles in the improvement project
2. Stakeholder analysis
3. Communication plan
4. Milestone plan
5. Activity plan (progress)
6. Risk assessment
7. Business case and other gains

# Team roles | Manning of key personnel in the improvement project's phases

## Key roles:

- Business Process owner: Jane Olsen
- Project sponsor: Jane Olsen
- Business Process Manager: John Smith

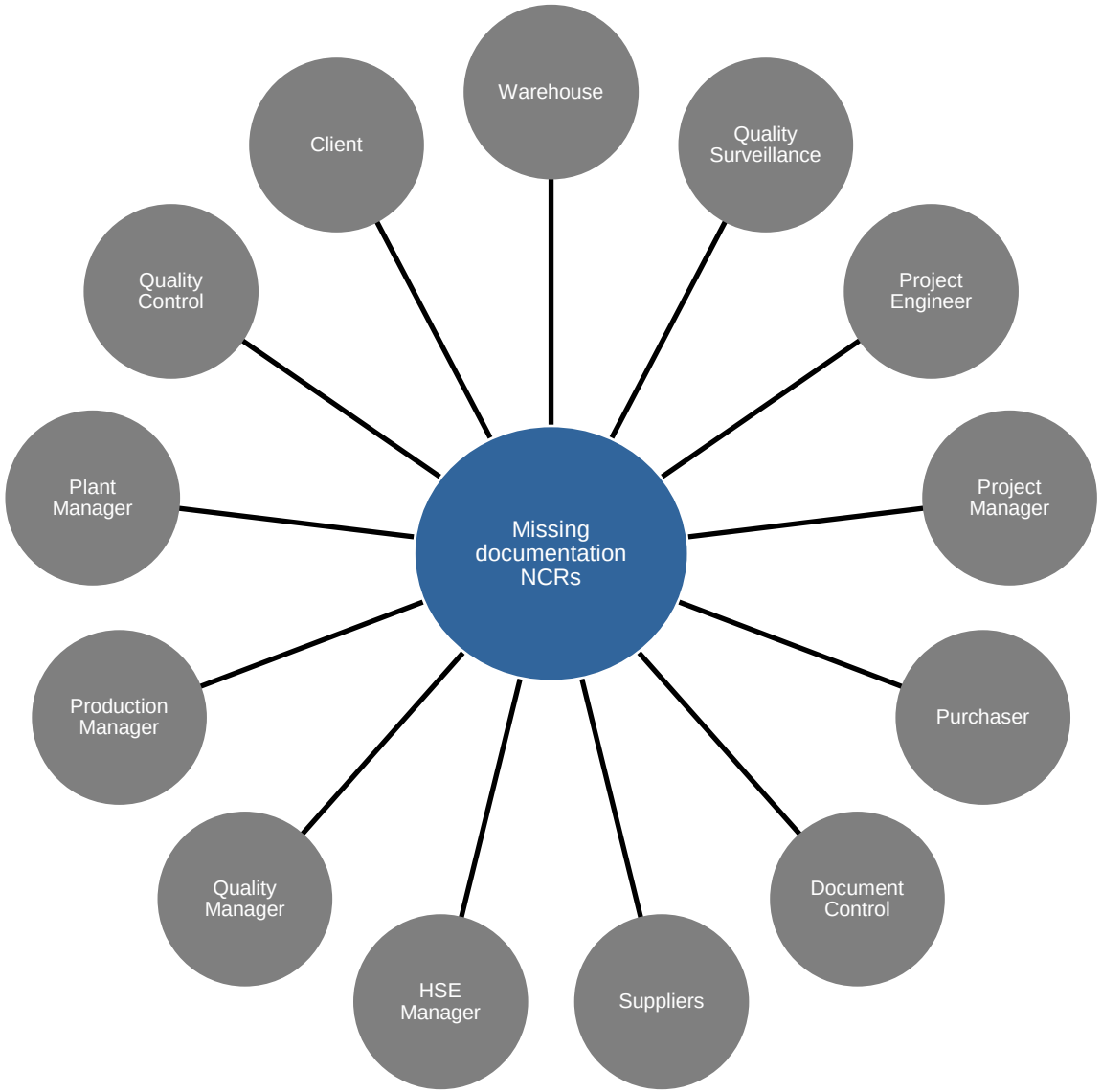
## Local BIT (steering committee):

- Patrick H
- Ana S
- Ben H
- Patricia M
- Andre N
- Camilla M

## Team roles:

| Name \ Phases | Define | Measure & Analyze | Improve | Control |
|---|---|---|---|---|
| Project Manager | NIJ (50%) | NIJ (50%) | NIJ (50%) | NIJ (50%) |
| Key project members | MM (25%), JOH (25%), EE (25%) | MM (25%), JOH (25%), EE (25%), AK (50%), MB (50%), AM (25%) | MM (25%), JOH (25%), EE (25%) , AK (50%), MB (50%) | MM (25%), JOH (25%), EE (25%), AK (10%), AM (10%) |
| Controller | MFL (10%) | MFL (10%) | | MFL (10%) |
| Coach | HB (25%) | HB (25%) | HB (10%) | HB (25%) |

# Stakeholder analysis | Most relevant stakeholders



# Communication plan | Excerpt from the Communication plan (separate document)

| Name/ stakeholder | Why get in contact? | What do we want to say? | How to convey the message? | Responsible | Support from | When? | Status |
|---|---|---|---|---|---|---|---|
| Steering committee | Communicate progress and risk, discuss challenges. | Go through the status, be clear on risk factors for the projects and where we need help. | In steering committee meetings (based on the Storyboard in PPT format) | Improvement project owner | Improvement project manager | Biweekly Fridays 12:00 | Done |
| Local management team | Progress and risk | Go through the status, be clear on how changes affect their processes. Agree on training plan. | In the monthly Management roundtable meeting (based on the Storyboard in PPT format) | Improvement project manager | Coach | Monthly, first Monday, every month | Done |
| Project Management team | Inform about the project status and result | How this project will affect project deliveries and what changes to implement in the projects. | | | | | |
| Supply Chain and Planning & Delivery control | Inform about the project (status, actions and results) | | | | | | |
| Business Area Top Management team | Inform about the project (status, actions and results) | | | | | | |
| Client representative | Inform about the project | | | | | | |

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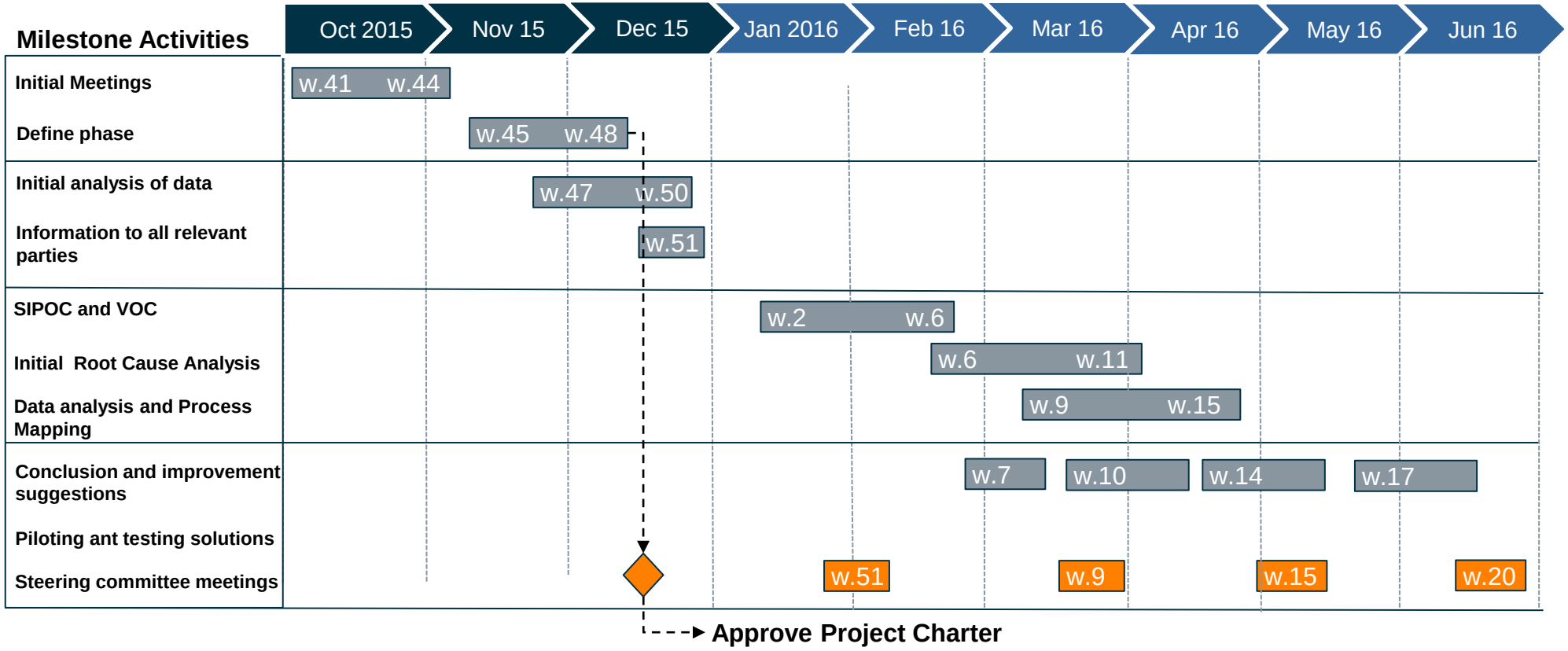
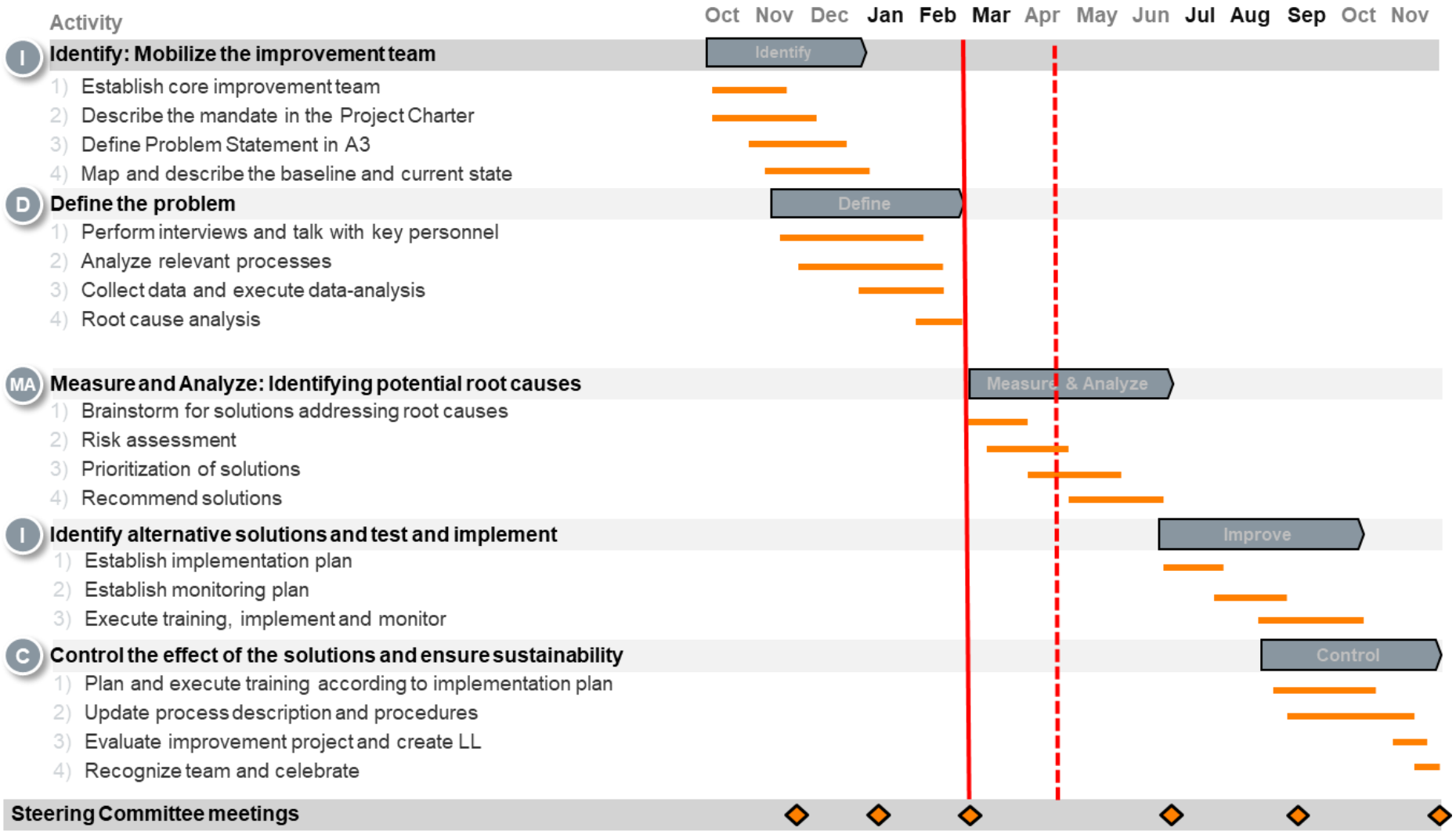
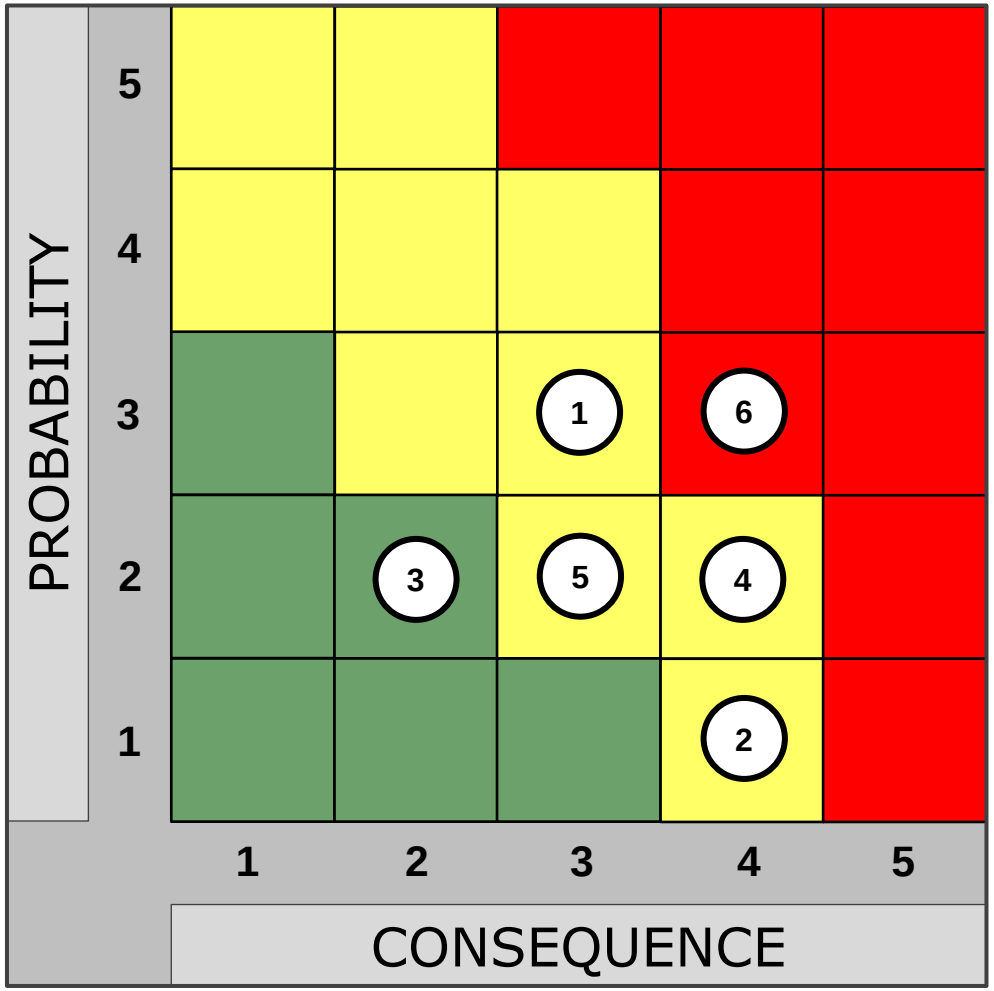
# Milestone plan | Key deliverables in the improvement project



# Activity (progress) plan | Excerpt from the plan (see Excel file)



# Risk assessment | Risk elements preventing the success of the improvement project




## Identified risk factors:

1. Limited access to key personnel
2. Lack of support from local management
3. Access/availability to relevant data
4. Support from coach (Lean navigator)
5. Opportunity to change global process description
6. Making necessary changes in IT systems

*Note! Actions (output) from the risk assessment are described in the activity plan.*

# Business Case | Financial benefits and other gains

**Just examples – real benefits removed from this business case**

**Created by –** Project Manager: XXX **Verified by –** Business Controller: XXX **Date:** XXX

Total estimated EBITDA effect in project ETC: XXX mNOK

Financially Quantifiable Benefits:

- *Describe a potential "hard" measurable benefits , which may or may not has a direct EBITDA effect*
- *Refer to APPENDIX 1 for more details and examples*
- *…*

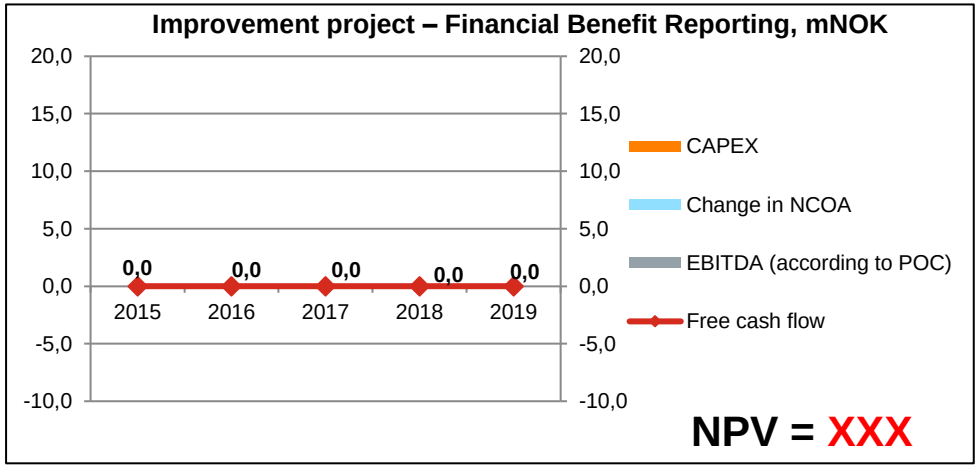
**Other Quantifiable & Qualitative Benefits:**

- *Describe a potential "soft" benefits , which may or may not be measured and do not have a clear quantifiable impact on EBITDA*
- *Refer to next page for more details and examples*
- *…*

**Cost estimates:**

Total costs : **~ XXX mNOK** (*Describe cost estimate related to the project*)

| | |
|---|---|
| **OPEX:** | |
| Internal project resources | XXX mNOK |
| External project resources | XXX mNOK |
| Other expenses, (i.e. travel) | XXX mNOK |
| **Total OPEX:** | XXX mNOK |
| | |
| **CAPEX:** | |
| Investment | XXX mNOK |
| Assets | XXX mNOK |
| **Total CAPEX:** | XXX mNOK |



# Business Case | Financial benefits and other gains

Just examples – real benefits removed from the storyboard

| | Categories | Benefit Types | Possible Measures |
|---|---|---|---|
| Financially Quantifiable | Operational | ▪ **Revenue Enhancement** | … Increase sales by 20% / Change client agreement to increase the price by $ 200m |
| | | ▪ **Operating Cost** | … Reduce man hour by 40% would realize $250m cost savings on project from within next 3 yrs |
| | | ▪ **Working Capital** | … Double annual inventory returns in 2016 |
| | | ▪ **Cash Flow** | … Increase operational cash flow by 25% by improved assets value and inventory turnaround |
| | | ▪ **Capital Expenditure** | … Reduce CAPEX by $10m by avoiding cost to purchase extra equipment |
| | | ▪ **Efficiency** | … Reduce cycle time by 50% and improve direct labour cost per unit by $300 |
| | | ▪ **Effectiveness** | … Achieve close time of 3 days after period end / Reduce time to prepare |
| | | ▪ **Quality** | … Reduce error rate to 1 per 10,000 units reduce further annual scrap cost by $3m |
| | | ▪ **Innovation** | … Enable three new product launches in the next 12 months with potential sales increase by $500m |
| Other Quantifiable & Qualitative | Customer | ▪ **Brand** | … Achieve 95% brand recognition in market research survey |
| | | ▪ **Reputation** | … Win Industry Award for Excellence |
| | | ▪ **Customer Service** | … Achieve 9 out of 10 in customer satisfaction rating / improve on-time delivery by 30% |
| | People | ▪ **Morale** | … Reduce attrition rate of managers by 50% |
| | | ▪ **Capabilities** | … Develop strategic capabilities by re-skilling 200 managers |
| | | ▪ **Knowledge** | … Improve competency lvl by introducing CAD training for engineers below 3 yrs of seniority |
| | External Stakeholder | ▪ **Corporate Social Responsibility** | … Reduce carbon emission rates by 20% |
| | | ▪ **Regulatory** | … Comply with licensing conditions before 2016 end |
| | Other | ▪ **HSE** | |
| | | ▪ **Risk** | |
| | | ▪ **Collaboration** | |

# Improvement project | Reducing «Missing documentation» when receiving goods

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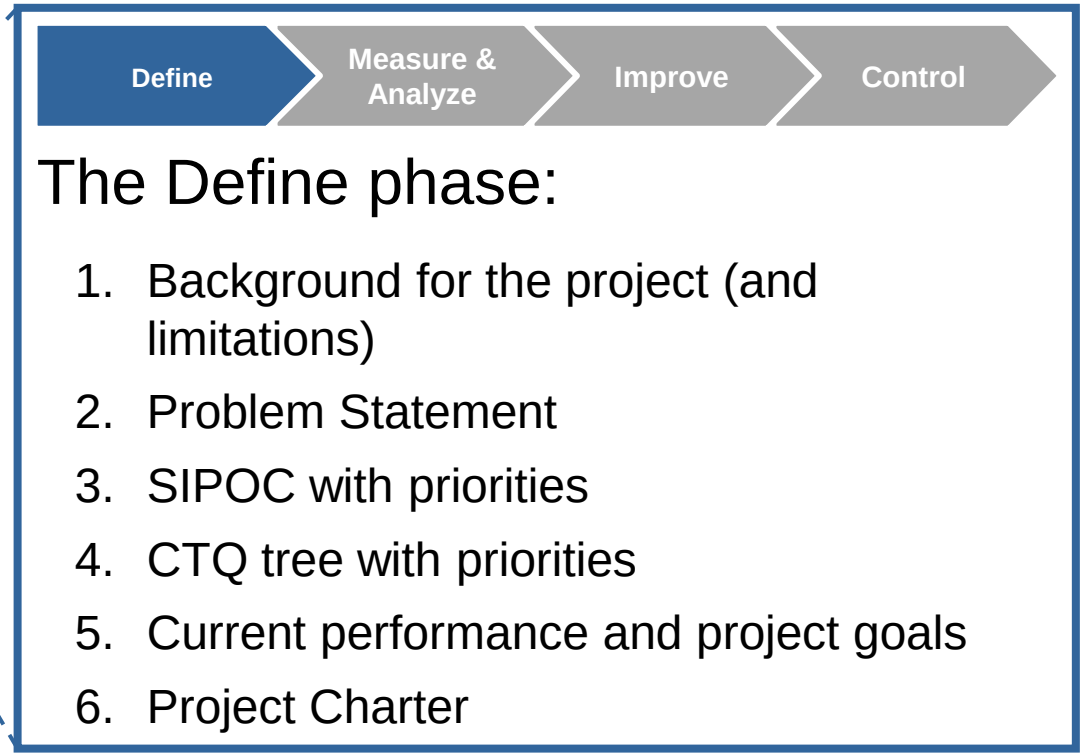


# Background information | Current situation

Facts and background information:

- A large number of NCRs due to “missing documentation in SAP” have been created at the factory for several years
- In 2015, 18% of incoming material ends up in blocked stock/quarantined in warehouse due to missing documentation
- 82% of all vendor NCRs (Z1) are related to missing documentation – 3348 in 2015
- Yearly cost – approx. 12,8 MNOK handling these NCRs (Incl. temp release)
- The average closing time for a “missing documentation NCR” is 68 days
- Each NCR has a high risk of delaying Start of Production at the factory
- “Temporary release” is used on 25% of the “missing documentation NCRs” – leading to a risk of non-compliant material in production

# Project Scope Requirement

## In scope:

- The improvement project team will analyze missing documentation NCRs for this factory only
- Analysis will be done on a random sample of 45 NCRs, created from week 44 – 46,  2015
- The team is responsible for analyzing the problem, finding root causes and suggest improvements (alternative solutions for root causes)
- The analysis will cover the delivery process (of documentation and materials) from the supplier, until goods received at the factory

## Out of scope:

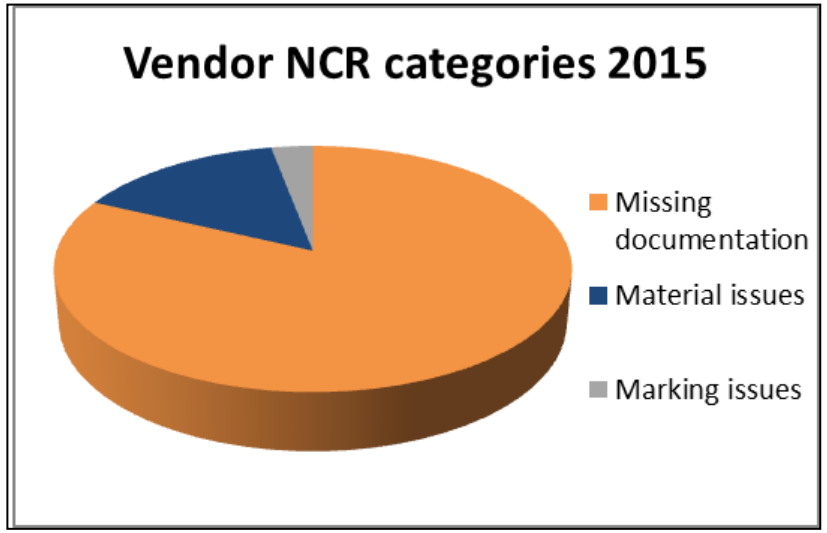
- The analysis will not cover the process from material release until PO placement because this is addressed in the “Shorten and stabilize lead times” improvement project
- The improvement project team will not drive/implement any recommendations for improvement
- Identified improvements outside existing organizational structures or responsibilities shall not be followed/implemented by this team
- IT-related improvements shall only be made within existing IT-systems or on existing IT platform

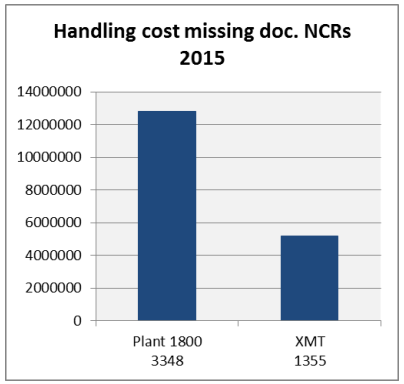
# Problem Statement | What is the problem?

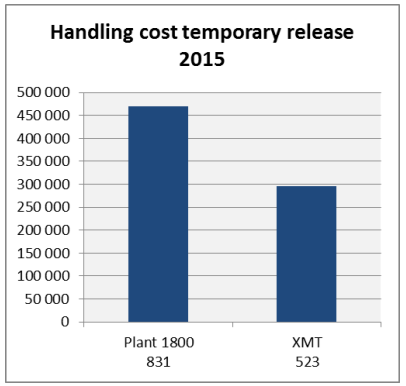
## Problem statement

When goods are received in the warehouse, a defined set of documentation shall accompany the goods. The required documentation is insufficient or missing in 18% of all goods received. This leads to:

- Unnecessary man-hours spent on handling these NCRs: 5 hours per NCR, involving 6 different departments ➔ cost 12,8 MNOK last year.
- There is a risk of delaying Start of Production at the factory and delayed delivery to Client – 11% of MC findings is due to missing supp. docs. in SAP.
- 25% of all missing documentation NCRs were temporary released from restricted stock ➔ HSE and quality risk.



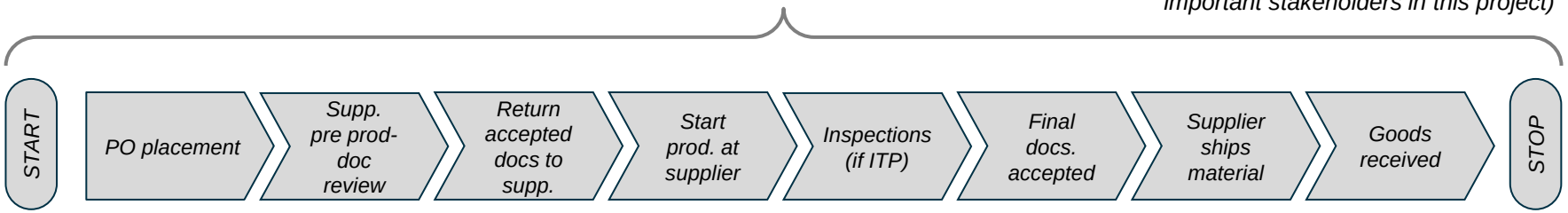
# SIPOC | High-level process description (*where* is this problem)

## Process description

This process describes the delivery of documentation and materials from the supplier, from PO placement until goods received at the factory.

| SUPPLIERS | INPUT | PROCESS | OUTPUT | CUSTOMERS |
|---|---|---|---|---|
| Client | Purchase Order (PO) | Process to receive material and post production documents from supplier | Material | Projects |
| Engineering | Master Doc. pack. | | Documentation | Planning department ✸ |
| Supply Chain | Supplier document. | | Invoice | Supply Chain |
| Suppliers | IT systems (DTS, SAP) | | Delivery evaluation | Manufacturing ✸ |
| Doc. Management | Inspections | | NCRs | Quality Management |
| Quality Surveillance | Procedures | | Temporary Release | Finance |
| Quality Management | NCR system (SAP) | | KPIs | Client |
| Manufacturing | Slot plan | | | |

✸ *Prioritized customers (these are the most important stakeholders in this project)*



# Voice of the customer | The CTQ-tree (Critical to quality) for Planning

| Customer | Category ("Driver") | Variable ("CTQ") | Requirement |
|---|---|---|---|
| The planning department manager:<br><br>*"We have a good process without non conformances due to missing documentation (in order to meet Start of Production), when…"* | Planning is good | - Updated Lead time<br>- Frozen BOM from project<br>- Start of Procurement on Time<br>- Adjusted T&Cs with split payment towards selected Suppliers | - Lead times 100% correct<br>- On Time and no changes<br>- Define common dates between project and SC plan<br>- Correct T&Cs per Supplier |
| | Technical Qualification is completed | - Technical Qualification of all cr1 material Suppliers incl. MPS etc. | - 100% Technical Qualification of all cr1 material Suppliers.<br>"Expert" resources in place to drive prog. |
| | When Material Documentation Package (MDP) is correct | - Correct specification and drawings at PO placement<br>- Design reviews completed for all cr1 materials prior to PO placement<br>- No EC's after PO placement | - 0 supplier requests with our cause<br>- 100% design reviews performed and verified in project design and verification plan<br>- 0 ECs after PO placement |
| | When Suppliers are shipping materials with approved final documentation | - No Inspections scheduled prior to completed MRBs<br>- QS have ensured all MRBs sent in before IRN handed over<br>- ATP process have been removed. | - Global process to ensure QS mandate<br>- 0 Vendor-NCR for missing supplier documentation<br>- Remove process |
| | We have good internal processes and culture | - Temp. Release Process voided<br>- No. of people in NCR process<br>- Strict Authority matrix not allowing project to by-pass process | - The process voided<br>- Maximum 2 involved in NCR process<br>- New Process defined |

# Voice of the customer | The CTQ-tree (Critical to quality) for Manufacturing

| Customer | Category ("Driver") | Variable ("CTQ") | Requirement |
|---|---|---|---|
| The manufacturing manager:<br><br>*"We have a good process without non conformances due to missing documentation (in order to safely meet Start of Production), when…"* | Planning is good | - Updated Lead time<br>- Frozen BOM from project<br>- Start of Procurement on Time<br>- Adjusted T&Cs with split payment towards selected Suppliers | - Lead times 100% correct<br>- On Time and no changes<br>- Define common dates between project and SC plan<br>- Correct T&Cs per Supplier |
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| | Good NCR process and HSE | - Clear roles and responsibilities<br>- NCRs: Closing time<br>- NCRs: Employees involved<br>- Temp. Release Process voided | - Role descriptions defined (all depts.)<br>- Maximum 1 month<br>- Maximum 2 employees<br>- The process voided |

# Baseline | Current performance on important performance indicators

## Baseline vs. Project goals

| Stakeholder | Prioritized variables from this stakeholder | Current performance | Project goals (12 months) | Actual achieved |
|---|---|---|---|---|
| Planning | Material with missing documentation received in the Warehouse (Numbers per year in parenthesis) | 18% (3.348) | 13% (2.500) | |
| Manufacturing | Cost related to man-hours handling the NCRs (measured by Finance) | MNOK 12,8 | MNOK 5,0 | |
| Manufacturing | Average days of closing a Missing Documentation NCR (average last 12 months) | 68 days | 20 days | |
| Planning | Number of employees involved in the NCR closing process | 5,1 | 2 | |
| Manufacturing | Use of “Temporary Release” on Blocked Stock items. | 25,1% | 5% | |

Note! The prioritized CTQ: «Start of procurement on time» is addressed in a separate SCM project.

When M&A was started, cost for NCR management, closing time for NCRs and number of people involved in the NCR process was one fishbone diagram.

# The Define-phase | Summary

**A** What is the problem?

**B** Where are important causes found?

**C** Who are the customers?

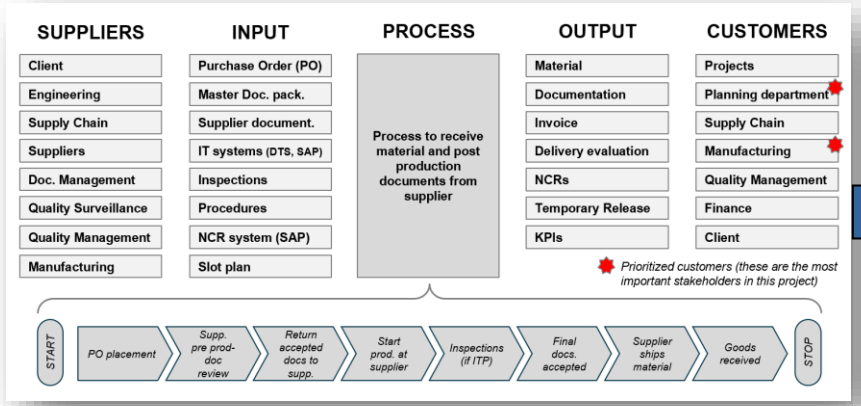
**D** What are the customers' requirements ?

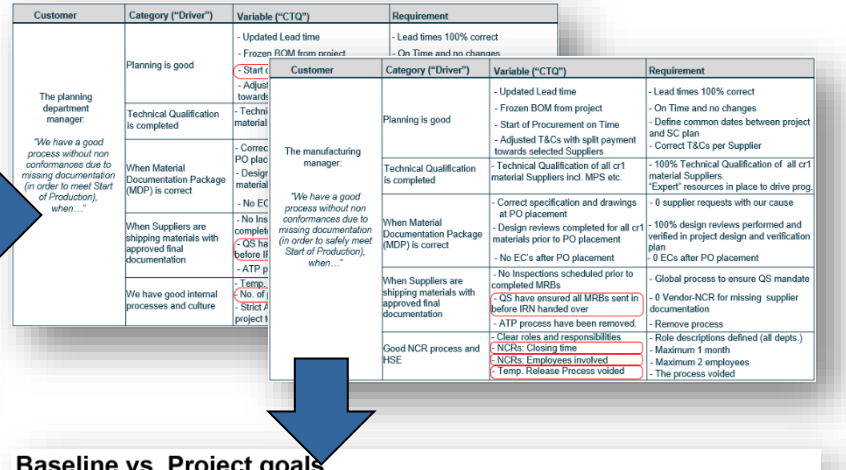
**E** How is our performance today (baseline)?

### Problem statement

When goods are received in the warehouse, a defined set of documentation shall accompany the goods. The required documentation is insufficient or missing in 18% of all goods received. This leads to:

- Generation of a "Missing Documentation NCR" for each item.
- A lot of man-hours used for handling these NCRs.
- Material without proper documentation are put on "Blocked Stock" however an emergency procedure called "Temporary release" is used to free the material, this leads to a quality and HSE risk in our production.

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# The Project Charter | Approved – decision to continue the project to next phase

Example of charter – real charter removed from the storyboard

## Project Charter

| Main data | Description | Project team members | |
|---|---|---|---|
| Project name | | Name | Role/unit |
| Program name | | Name | Role/unit |
| Sponsor | | Name | Role/unit |
| Project Manager | | Name | Role/unit |
| Coach | | Name | Role/unit |
| Start date | | Name | Role/unit |
| Reference/ID | | Name | Role/unit |

| Details | Description | |
|---|---|---|
| Background information | | |
| Problem statement | | |
| BC summary | | |
| Process scope | Start of the process:<br>End of the process: | |
| Project scope | Included in scope:<br>Excluded in scope: | |

| Project goal | Selected CTQ | Baseline | Requirement | Internal goal |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

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Define | **Measure & Analyze** | Improve | Control

## The Measure & Analyze phase:

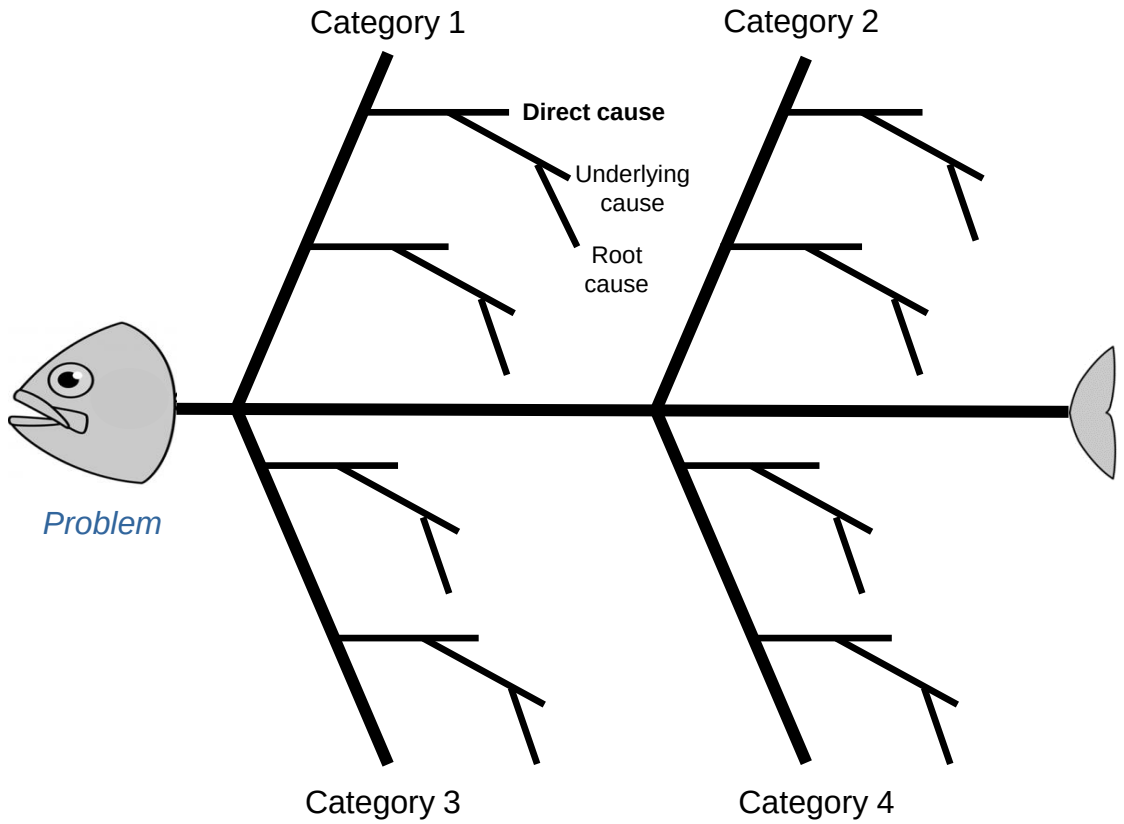
1. Preliminary fishbone diagram
2. Data collection plan
3. Data analysis - summary
4. Process analysis - summary
5. Voting - summary
6. Revised fishbone diagram

# Measure & Analyze | What are the assumed most important direct causes?

Step 1 is to identify ***direct causes*** (causes that are typical visual and/or measurable), related to the problem.

Key problems to address:

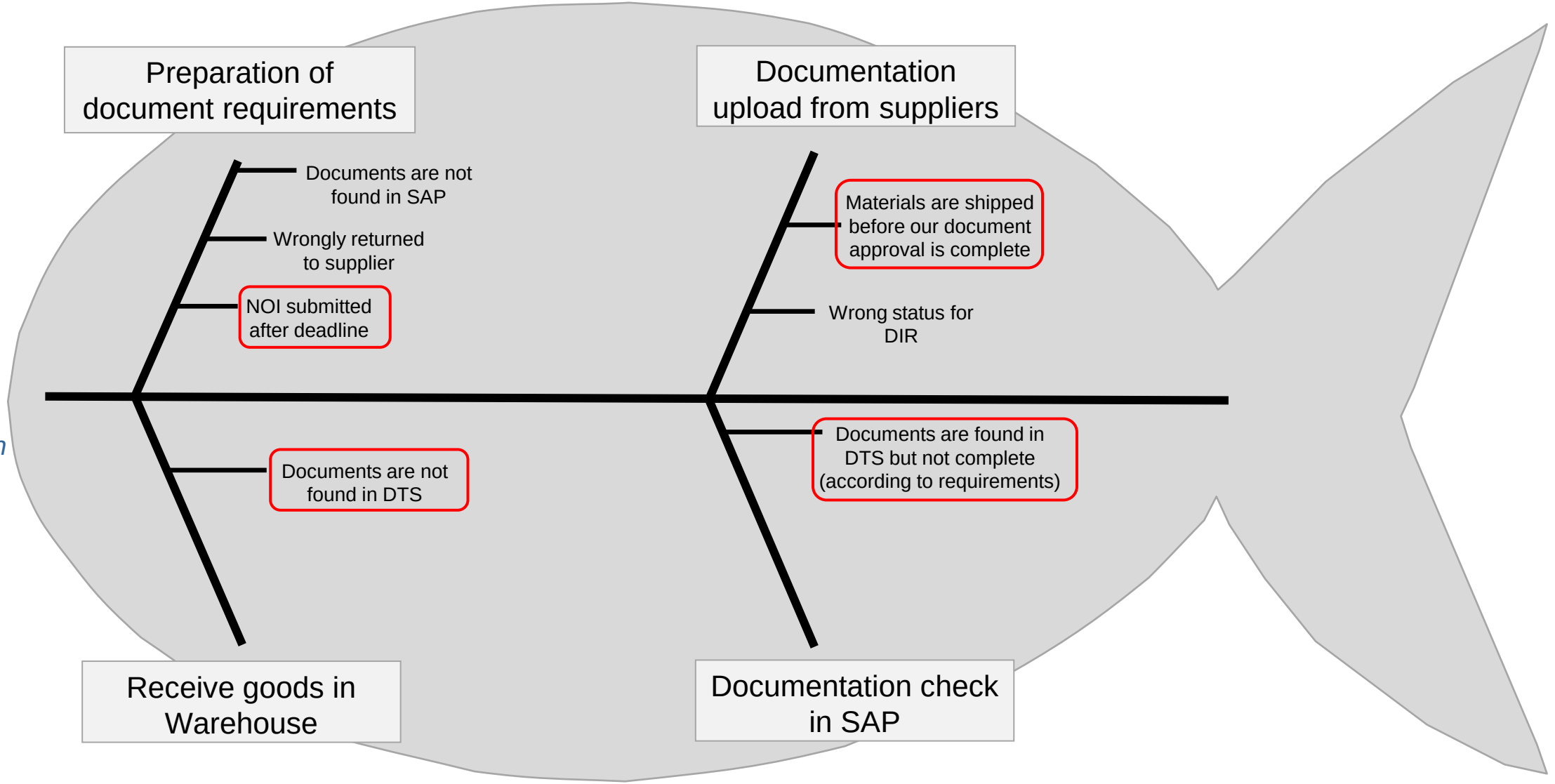
1. Material is received with missing documentation (18%)
2. Long NCR closing time (68 days)
3. Temp Release is frequently used (25,1%)




*One fishbone diagram will be made for each problem*

# Measure & Analyze | Initial fishbone: Missing material and direct causes

*Material is received with missing documentation (18%)*



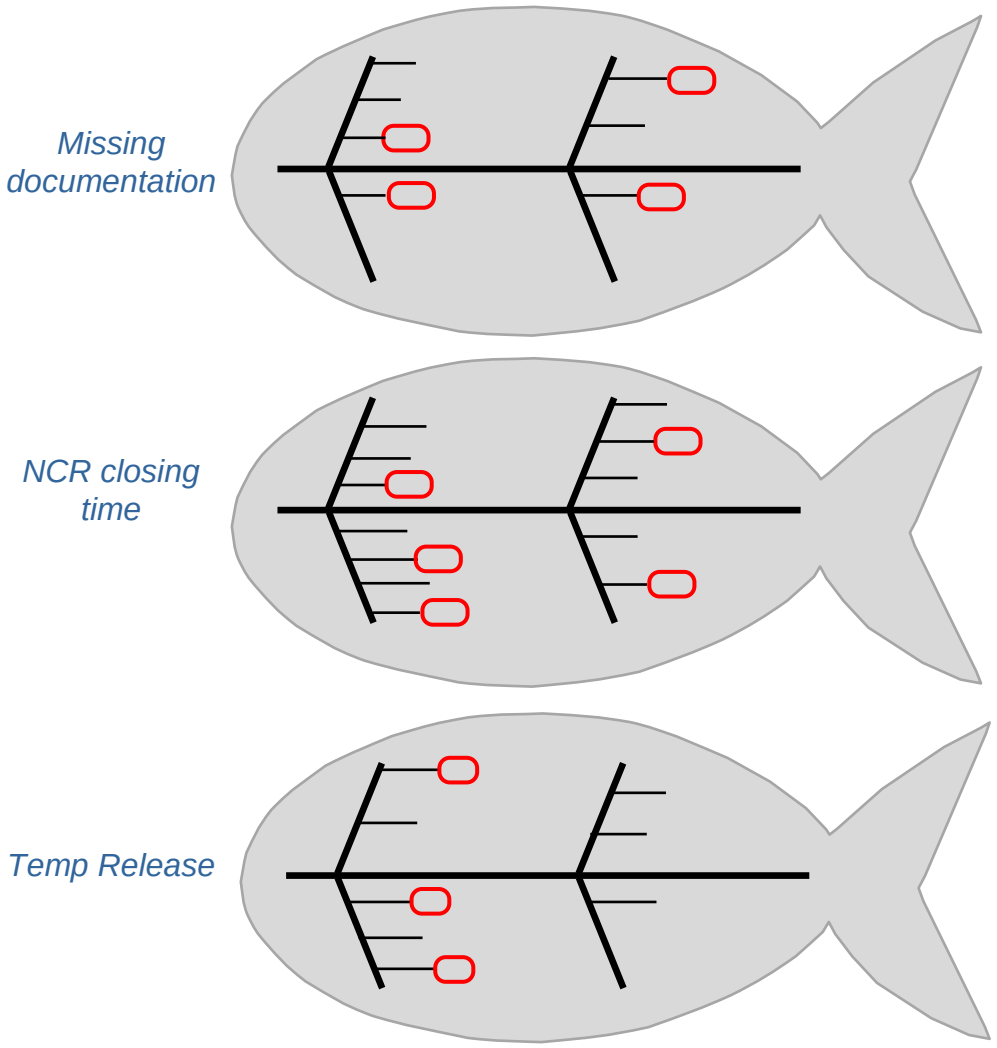
# Measure & Analyze | The initial fishbones are the basis before “the three paths”

Assumed most important **direct** causes

*Missing documentation*

*NCR closing time*

*Temp Release*

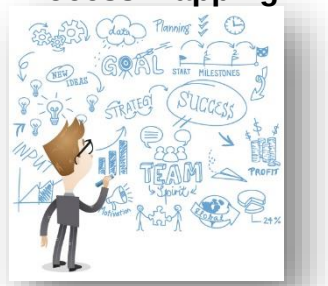


*The next step is to verify or reject the assumed direct causes. This is done through:*

**Data analysis**

**Voting**

**Process mapping**



# Data collection | Identify which relevant data to use (“scoping”)

**Starting point:**

3200 NCRs due to Missing Documentation in SAP (the 9 first months of this year)

**Initial data selection:**

***Analyze NCRs for 3 months for plant our factory (950)***

→ **Conclusion:** **Too many**

**Narrowing the scope:**

***Narrowed down to NCRs for 6 months for Production department only***

→ **Conclusion:** **Still too many**

**Need to narrow down even more:**

***Narrowed down to NCRs for 3 months for Production department only***

→ **Conclusion:** **Still too many and complicated to understand possible root causes**

**Narrowing further down:**

***Decision to analyze open NCRs – 15 random per week for 5 weeks***

→ **Conclusion:** **Still very time consuming**

**Conclusion after three weeks:**

NCRs enough as basis for input to RCA (see next slides)

# Data analysis | Data analysis process

**Selection of NCRs to analyze**

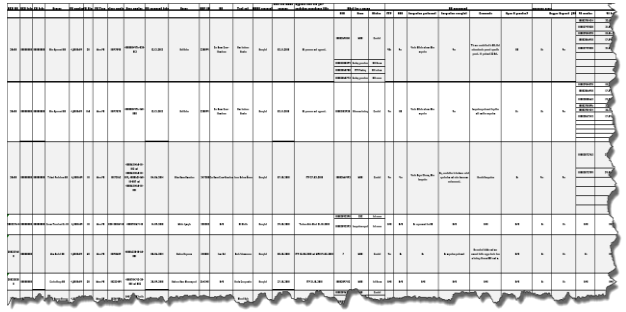
- 15 random NCRs per week
- Production department

**Check of NCRs**

- GR date – SAP
- Pre prod. documents - SAP
- QS involvement
- NOIs – talk to QS coordinator
- Temporary release - SAP
- Supplier requests - SAP
- Engineering changes on material – SAP
- Handling time of supplier documentation - DTS
- Causes – talk to buyers, engineers, QS etc.

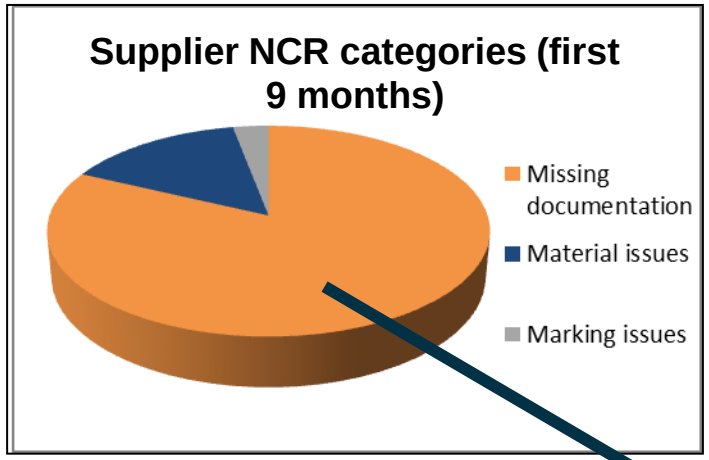
**Categorization of NCRs**

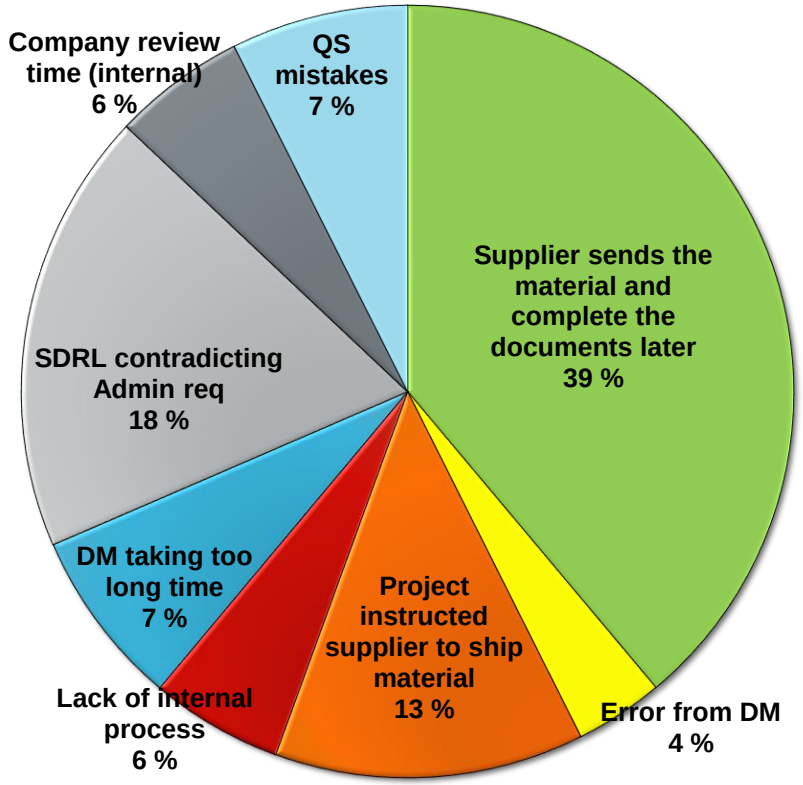
- First overview gave 7 different categories



**Conclusion of data analysis**

# Data analysis | Analysis of NCR categories



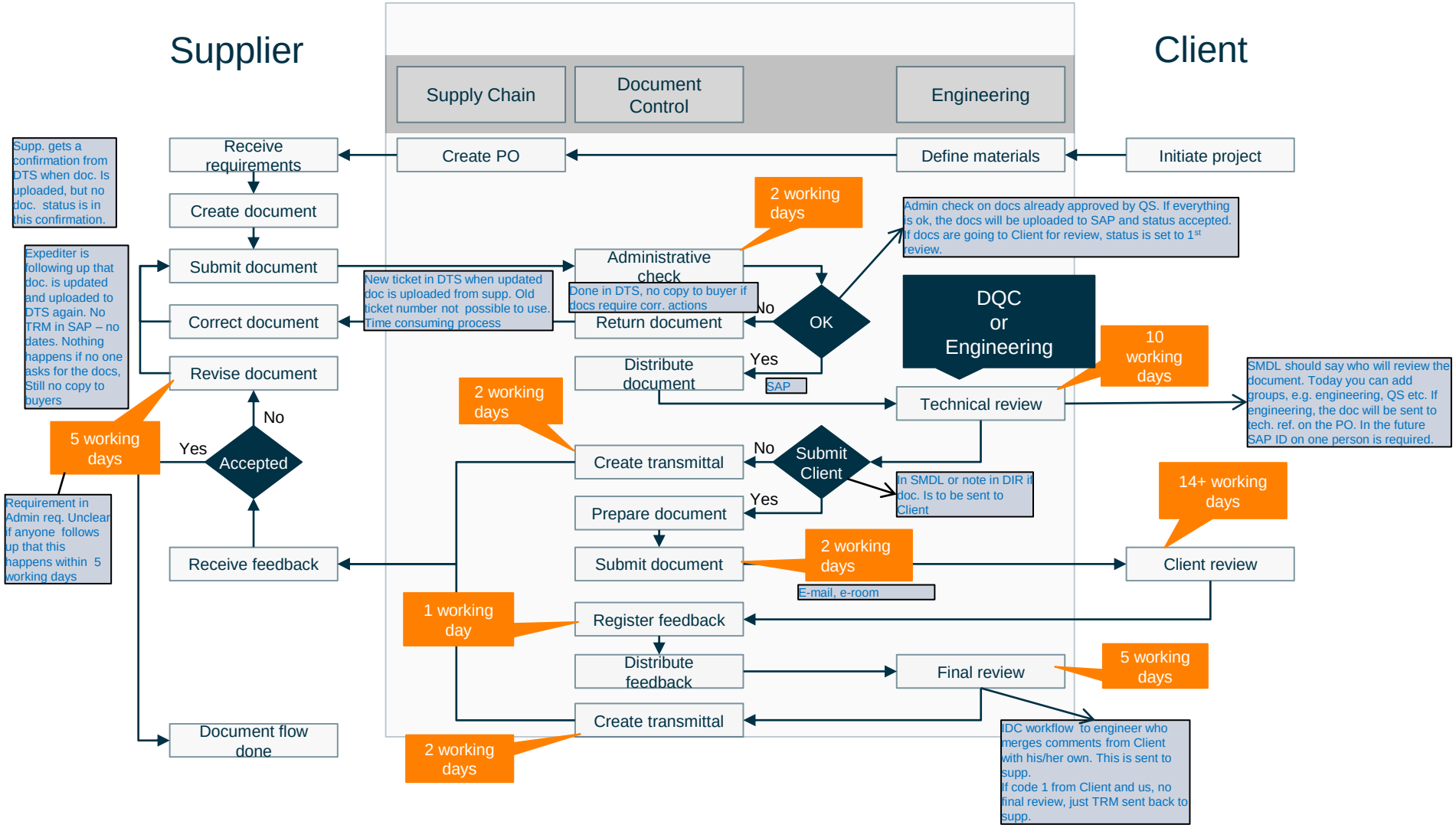
# Data analysis | Conclusions

- SDRLs and Administrative requirements are contradicting wrt. when MRBs should be delivered
- Time from documents are uploaded to SAP from DTS – more than 48hours
- When material and documentation is accepted in final inspection, material arrives at the factory before documents are uploaded to SAP
- Project and the factory are instructing suppliers to ship material before documentation is accepted
- Suppliers are ignoring the contract
- No consequences for suppliers and the project when materials are sent without accepted documentation
- Not clearly defined when to use code 2 (accepted with comments) and 3 (rejected) on documents

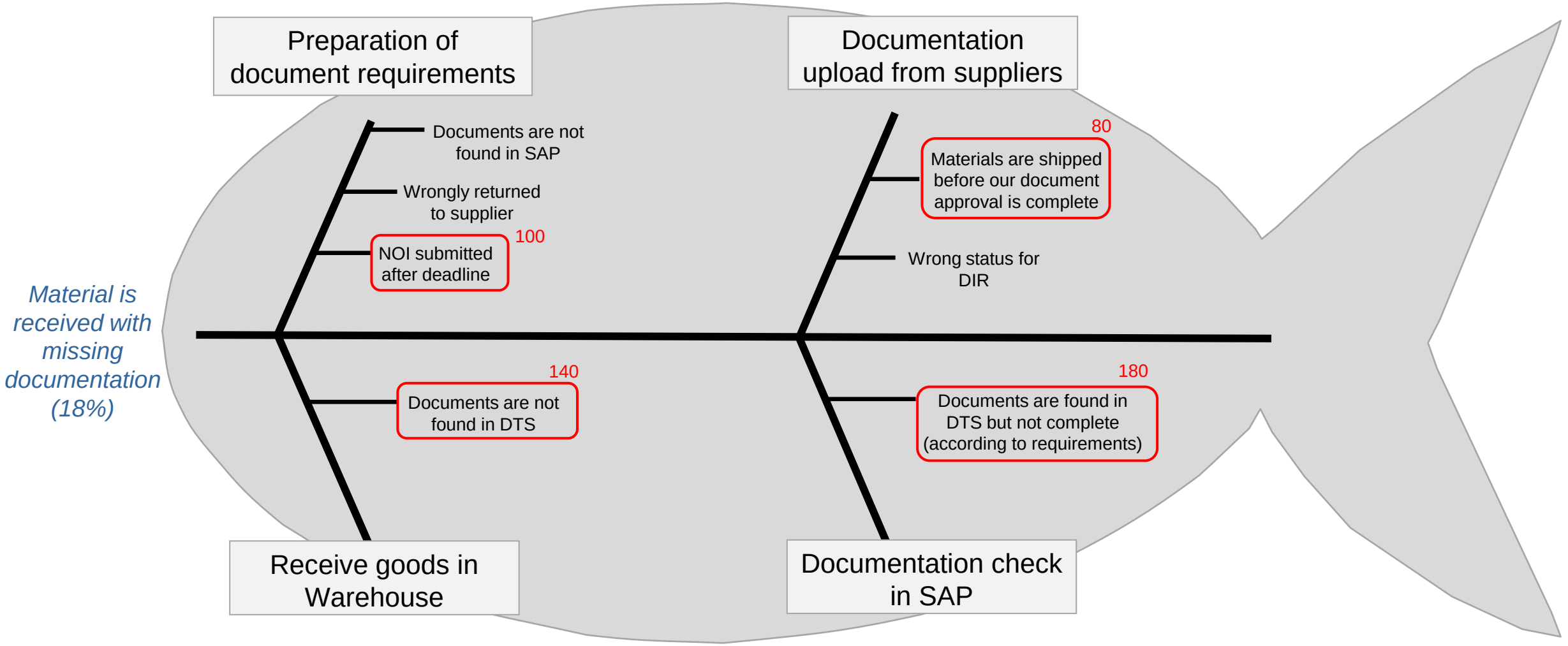
- Split and partial deliveries - SMDL should be revised by DM and new doc numbers to be issued to supplier
- MC findings – 11% of all MC inspections results in findings due to missing accepted supplier documentation
- QS procedure are allowing projects to overrule QS
- WP manager should sign the ATP, not followed – signed by e.g. WP engineers, PPM
- Buyers lack knowledge of procurement process – training can not be documented
- Use of unqualified suppliers
- Client requirements varies from delivery to delivery (no standards are defined)

Note! Documentation of the above statement is found in the Appendix

# Process analysis | "Working days" in the supplier documentation management process



# Measure & Analyze | Voting: Using key personnel's experience in prioritizing direct causes




5 key employees with long experience from the process: Distributed 100 points on prioritized direct causes.

# Measure & Analyze | After the “the three paths” the assumed direct causes are found

**Assumed** most important direct causes

*Missing documentation*

*NCR closing time*

*Temp Release*

*Increased insight through:*

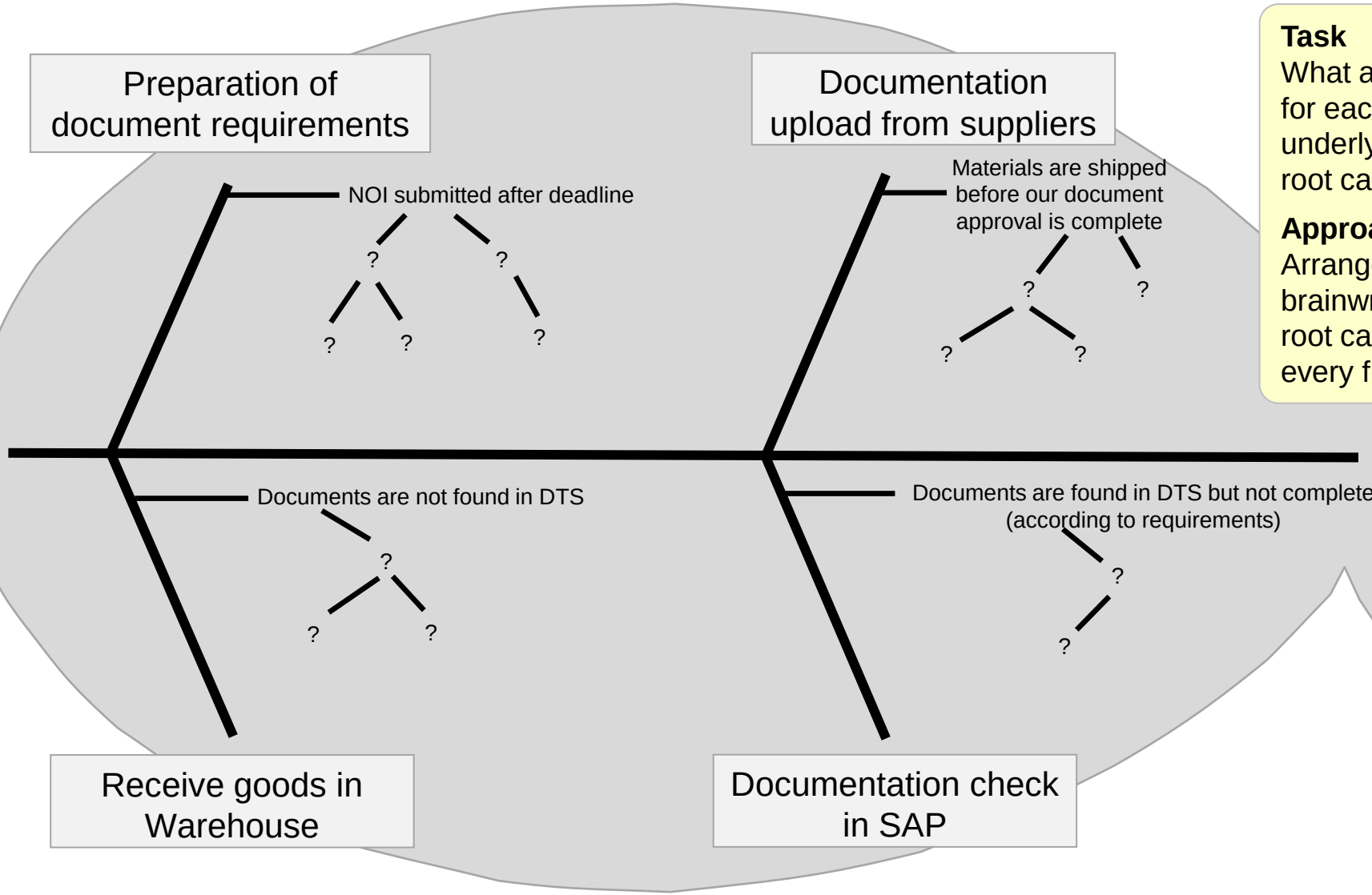
**Data analysis**

**Voting**

**Process mapping**


**Verified** most important direct causes

# Measure & Analyze | Initial fishbone: Identifying possible root causes




**Task**
What are the underlying causes for each cause? For each underlying cause; what are the root causes?

**Approach**
Arrange a workshop and use brainwriting to identify possible root causes. This is done for every fishbone diagram.

# Measure & Analyze | Root cause analysis using 5 Whys – one example

**Verified direct cause:**
Materials are shipped before our document approval is complete.

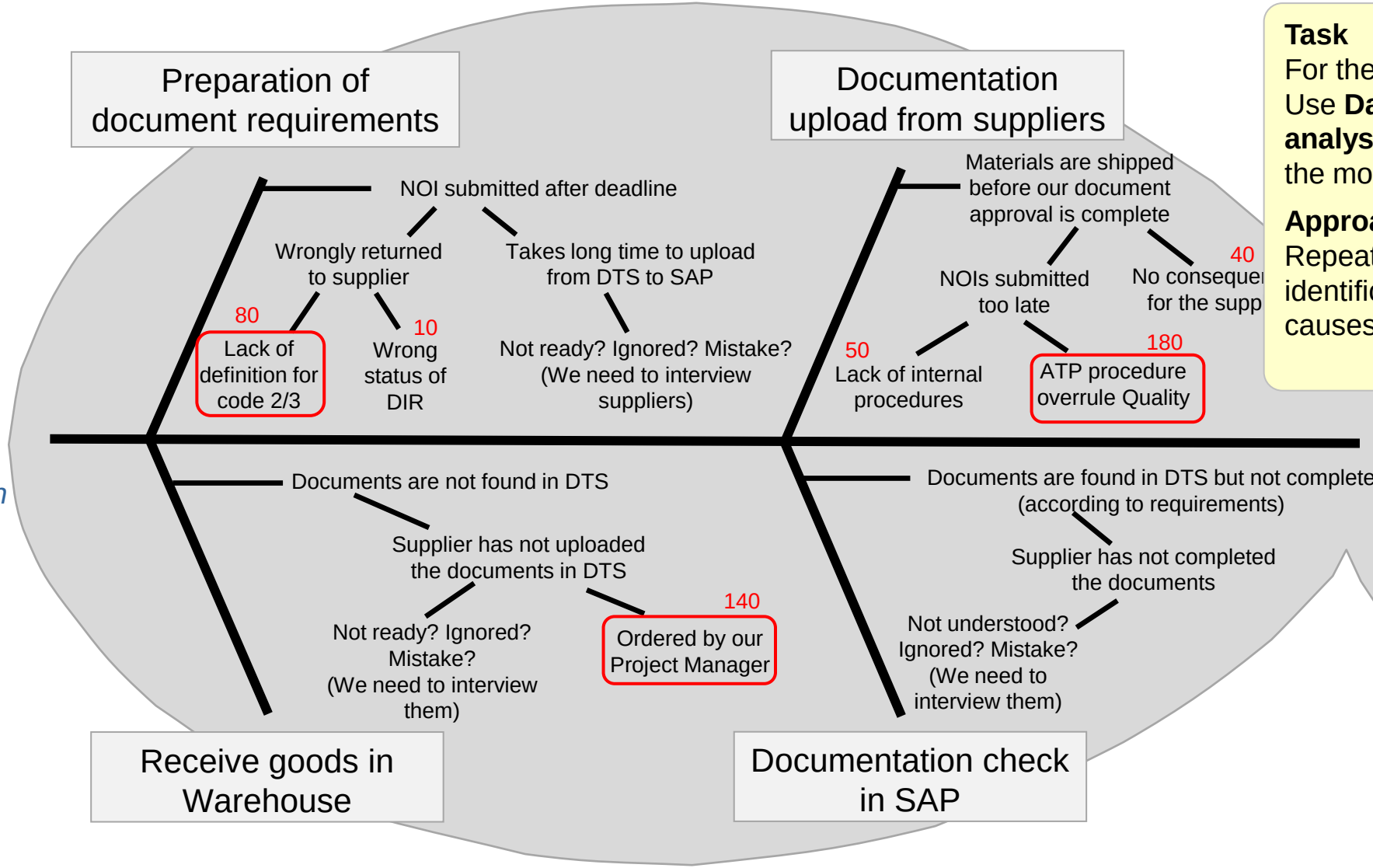
| | |
|---|---|
| *Why is it happening?* | Late release of materials in SAP (engineering). |
| Why? | |
| *Why is engineering late?* | Indecision in engineering. No one wants to take responsibility and say: “this is good enough”. |
| Why? | |
| *Why indecision in engineering.?* | Too many inexperienced engineers in lead positions - too little focus on training and guidance. |
| Why? | |
| *Why lack of training* | No responsibility nor procedure for having a training plan and make sure new employees are up to speed on their tasks. |

**Possible actions (to be transferred to the Improve phase)**

- Formalize training plan/program for all new employees on a longer time frame perspective.
- Ensure all new employees are paired with ‘experienced’ mentors with time allocated for the purpose.
- Ensure On the job training in combination with mandatory e-learning and classroom courses (SAP).

# Measure & Analyze | Root cause analysis using 5 Whys: 32 root causes in 3 fishes

*Material is received with missing documentation (18%)*




**Task**
For the 32 assumed root causes: Use **Data analysis**, **Process analysis** and **Voting** to prioritize the most likely root causes.

**Approach**
Repeat the principles from identification of prioritized direct causes.

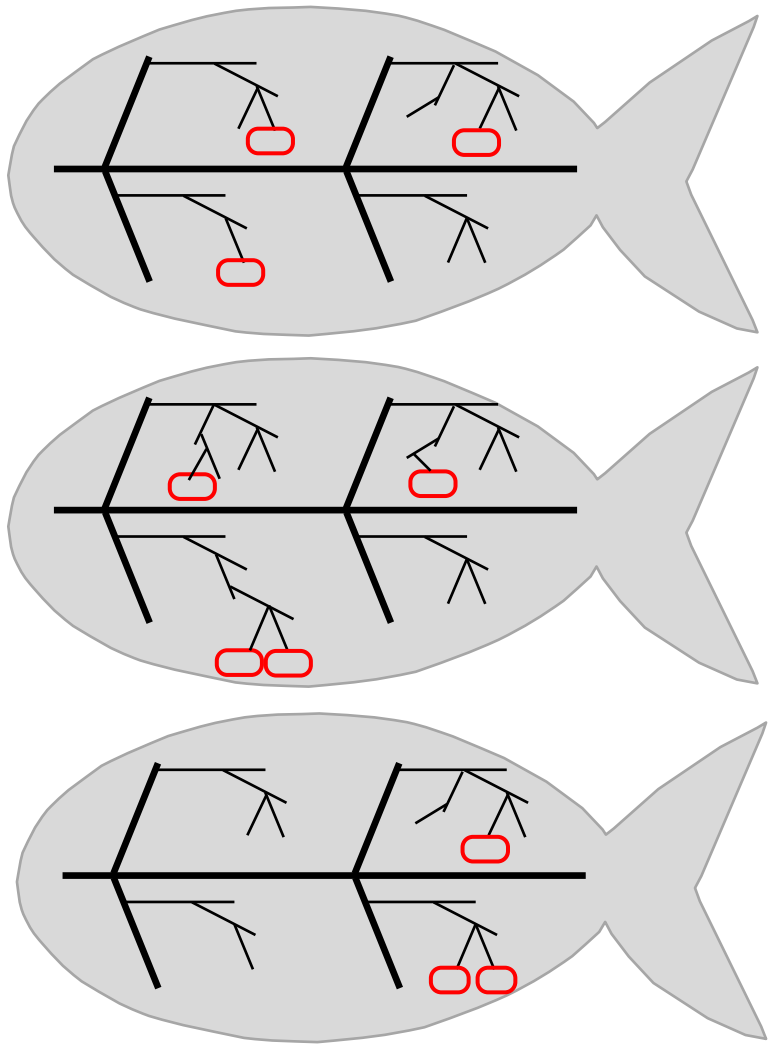
# Measure & Analyze | After the “the three paths” the assumed root causes are found

Assumed root causes

*Missing documentation*

*NCR closing time*

*Temp Release*



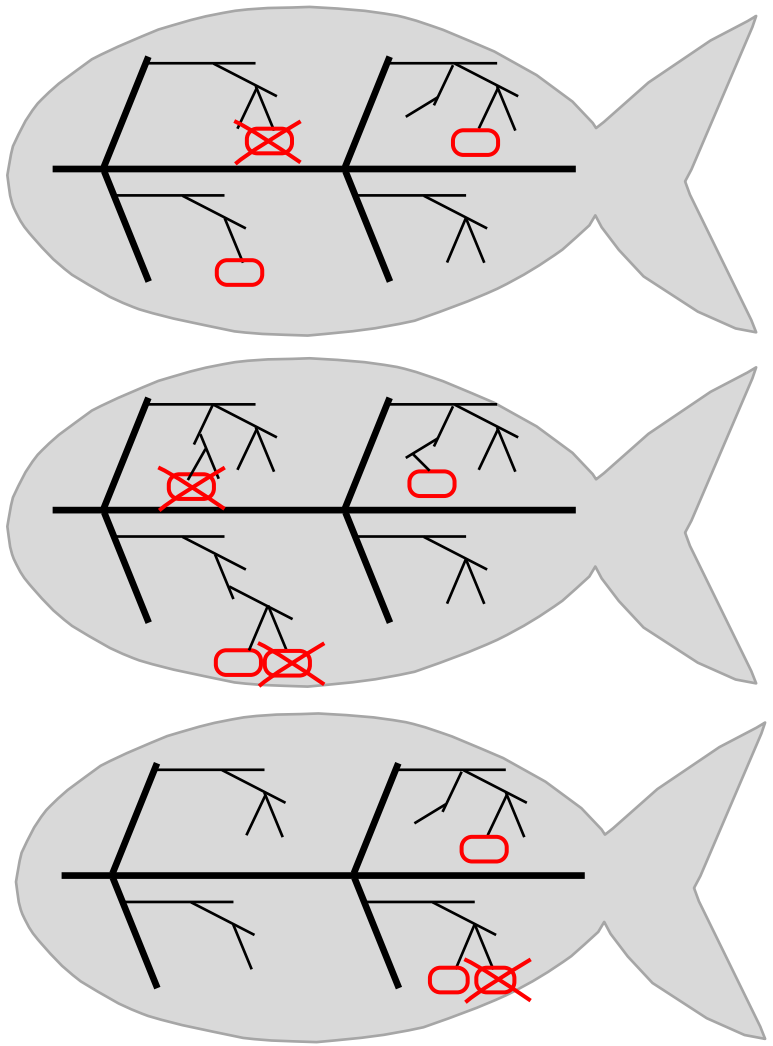
*Increased insight through:*

**Data analysis**

**Voting**

**Process mapping**


**Verified** most important root causes



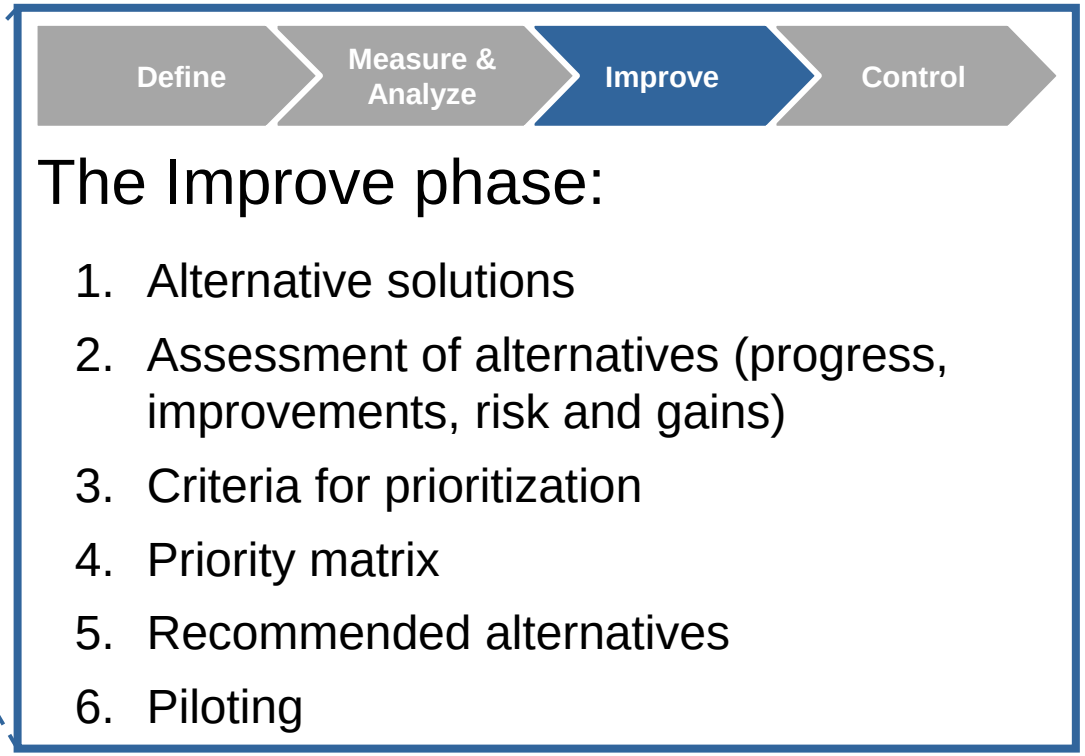
# Measure & Analyze | Justification of the selected root causes

| Effect (CTQ | Selected root cause (RC) | Why was this selected? |
|---|---|---|
| Missing documentation | RC1: Administrative errors/formalities leads to declining otherwise perfect documents. | See Root Cause Analysis #2 in Appendix. |
| | RC2: Project bypassing procurement process by directly instructing Suppliers or Buyers to ship materials prior to Final Documentation completed and approved. | See Root Cause Analysis #4 in Appendix. |
| | RC3: Global QS Procedure allowing project to overrule Quality | See Root Cause Analysis #8 in Appendix. |
| NCR closing time | RC4: An NCR has to be created immediately in Warehouse if documentation is missing. | See Root Cause Analysis #13 in Appendix. |
| | RC5: Responsibility for handling NCRs is unclear | See Root Cause Analysis #20 in Appendix. |
| | RC6: NCR Workflow in SAP is not complete. | See Root Cause Analysis #22 in Appendix. |
| Temporary Release | RC7: Low knowledge about the HSSE and quality challenges Temp Release leads to. | See Root Cause Analysis #26 in Appendix. |
| | RC8: Process for addressing missing documents is unknown. | See Root Cause Analysis #27 in Appendix. |
| | RC9: No other known alternative exist for the Project organization. | See Root Cause Analysis #31 in Appendix. |

# Improvement project | Reducing «Missing documentation» when receiving goods

## Content of this Storyboard:

1. Executive summary
2. Project tools
3. Documentation of the DMAIC phases
4. Appendix: Detailed analysis



# Improve | Looking ahead – who are the new stakeholders?

First:

- We revisit the stakeholder map and update this
- Based on the updated stakeholder map, the Communication plan is updated

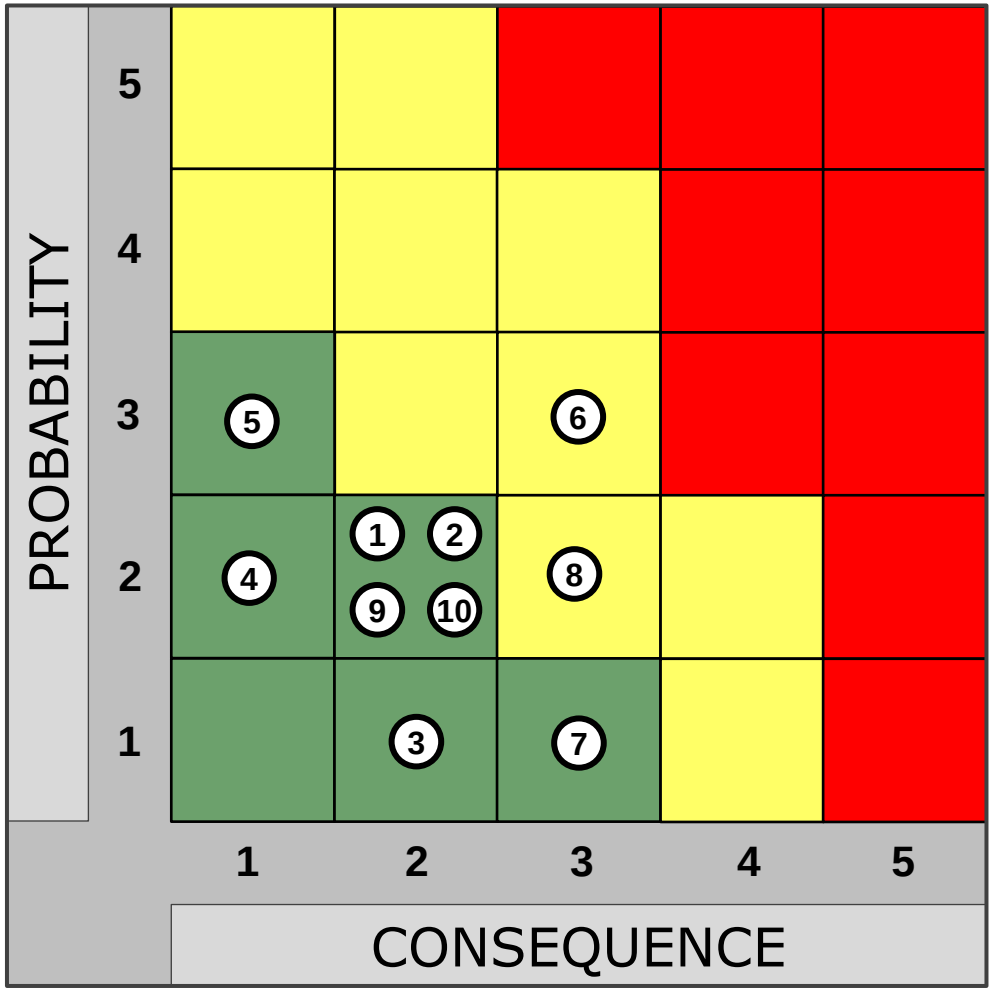

| Name/ stakeholder | Why get in contact? | What do we want to say? | How to convey the message? | Responsible | Support from | When? | Status |
|---|---|---|---|---|---|---|---|
| Steering committee | Communicate progress and risk, discuss challenges. | Go through the status, be clear on risk factors for the projects and where we need help. | In steering committee meetings (based on the Storyboard in PPT format) | Improvement project owner | Improvement project manager | Biweekly Fridays 12:00 | Done |
| Local management team | Progress and risk | Go through the status, be clear on how changes affect their processes. Agree on training plan. | In the monthly Management roundtable meeting (based on the Storyboard in PPT format) | Improvement project manager | Coach | Monthly, first Monday, every month | Done |
| Project Management team | Inform about the project status and result | How this project will affect project deliveries and what changes to implement in the projects. | | | | | |
| Supply Chain and Planning & Delivery control | Inform about the project (status, actions and results) | | | | | | |
| Business Area Top Management team | Inform about the project (status, actions and results) | | | | | | |
| Client representative | Inform about the project | | | | | | |

THE REST OF THE TABLE HAS BEEN DELETED

# Improve | Brainstorming workshop: Identification of relevant alternative solutions

| Effect (CTQ | RC | Alt | Possible solutions |
|---|---|---|---|
| Missing documentation | RC1 | 1 | Add document status “missing formalities” in SAP– document is accepted by QS, but are returned due to administrative failures. |
| | RC2 | 2<br>3 | a) Inform all managers and teams in Projects about existing process and procedures.<br>b) Include this in onboarding training for new Project managers and Lead Engineers. |
| | RC3 | - | Same as for RC2 (must be coordinated). |
| NCR closing time | RC4 | 4 | Wait 72 hours at GR (Warehouse) before missing doc NCR is created. Should be piloted in 4 weeks before the global procedure is updated. |
| | RC5 | 5<br><br>6 | a) Revise and update IRN process – specify the consequence for the supplier when they ship material without documentation.<br>b) Update T&Cs and inform all suppliers. |
| | RC6 | 7<br>8 | a) Revise and update workflow in SAP.<br>b) Appoint NCR contacts in Engineering (support) and Planning. |
| Temporary Release | RC7 | - | Coordinate with RC2 a and b. |
| | RC8 | 9<br>10 | a) Revise and update process.<br>b) Train Document Centre and Purchasers in new process. |
| | RC9 | - | Coordinate with RC2 a and b. |

# Improve | Risk assessment of possible alternatives




## Recommended alternative solutions:

1. Add document status “missing formalities” in SAP
2. Inform all managers and teams about existing process
3. Include this in onboarding training
4. Test 72 hours grace period before NCR is created
5. Revise and update IRN process
6. Update T&Cs and inform all suppliers
7. Revise and update workflow in SAP
8. Appoint NCR contacts in Engineering (support) and Planning
9. Revise and update missing docs process
10. Train Document Centre and Purchasers in new process

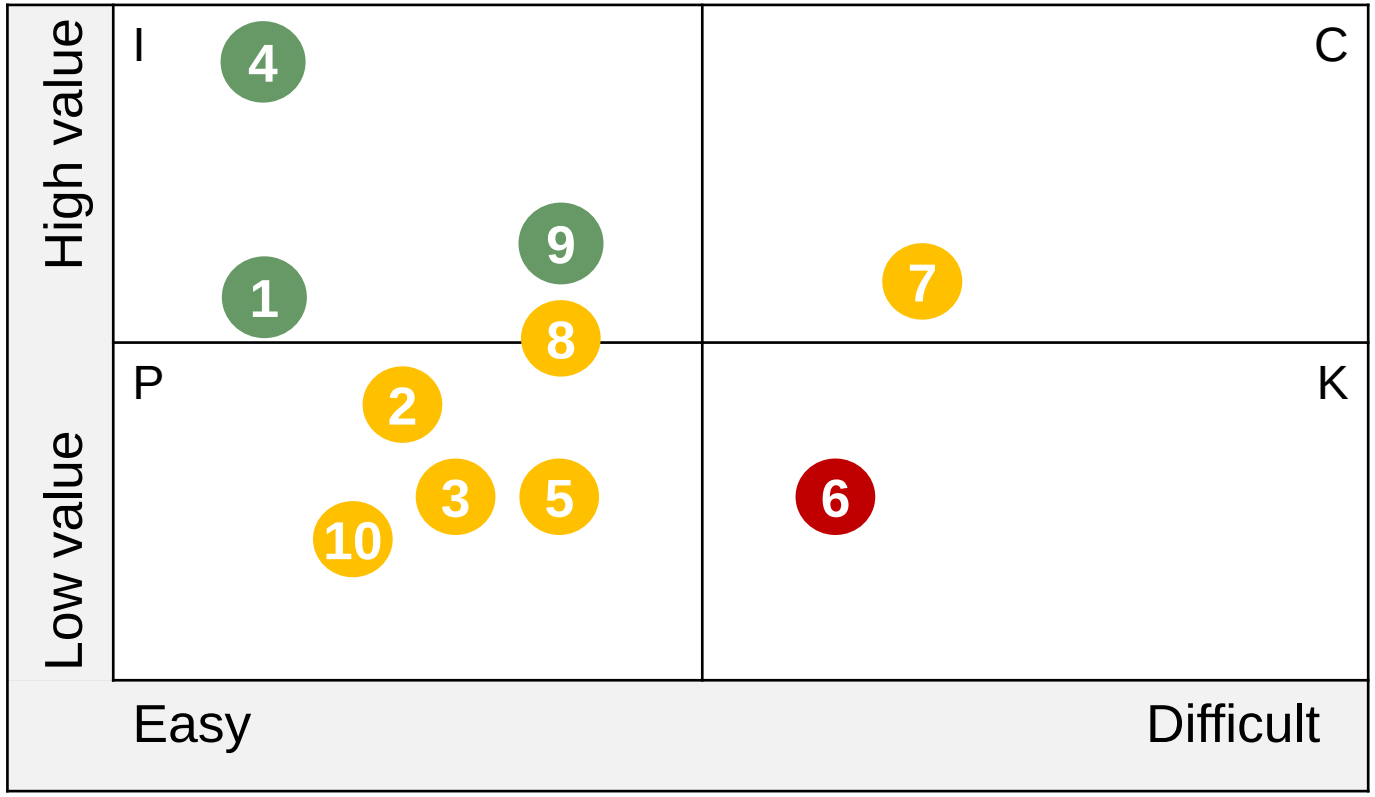
“Probability” is the probability of not succeeding with this solution and “Consequence” is the consequence if this solution fails.

# Improve | Alternative solutions: Risk, progress and benefits/gains

| Effect (CTQ | RC | Alt | Possible solutions | Risk | Man-hours | Expected benefits/gains (summary) |
|---|---|---|---|---|---|---|
| Missing documentation | RC1 | 1 | Add document status “missing formalities” in SAP. | 4 | 20-25 | 75% reduction in late documents |
| | RC2 | 2<br>3 | a) Inform all managers and teams in Projects about existing process and procedures.<br>b) Include this in onboarding training. | 4<br>2 | a) 70-80<br>b) 15-20 | a) Suppliers never to be contacted for bypassing the process.<br>b) As above. |
| | RC3 | - | Same as for RC2 (must be coordinated). | | | |
| NCR closing time | RC4 | 4 | Wait 72 hours at GR (Warehouse) before missing doc NCR is created. | 2 | 2-3 | 50% reduction in NCRs. |
| | RC5 | 5<br>6 | a) Revise and update IRN process.<br>b) Update T&Cs and inform all suppliers. | 3<br>9 | a) 15-20<br>b) 80-100 | a) Supporting alternative 1.<br>b) Supporting alternative 1. |
| | RC6 | 7<br>8 | a) Revise and update workflow in SAP.<br>b) Appoint NCR contacts in Engineering and Planning. | 3<br>6 | a) 30-40<br>b) 30-40 | a) Reducing average NCR handling time to 2 hours.<br>b) As a above. |
| Temporary Release | RC7 | - | Coordinate with RC2 a and b. | | | |
| | RC8 | 9<br>10 | a) Revise and update process.<br>b) Train Document Centre and Purchasers in new process. | 4<br>4 | a) 15-20<br>b) 50-60 | a) Reducing contact with suppliers about missing documents with 90%<br>b) Supporting a above) |
| | RC9 | - | Coordinate with RC2 a and b. | | | |

# Improve | Prioritization of the possible alternatives

## PICK matrix




P = Possible to do, I = Implement it, C = Challenging to do, K = Kill it.

## Recommended alternative solutions:

1. Add document status “missing formalities” in SAP
2. Inform all managers and teams about existing process
3. Include this in onboarding training
4. Test 72 hours grace period before NCR is created
5. Revise and update IRN process
6. Update T&Cs and inform all suppliers
7. Revise and update workflow in SAP
8. Appoint NCR contacts in Engineering (support) and Planning
9. Revise and update missing docs process
10. Train Document Centre and Purchasers in new process

# Improve | Decision on alternative solutions (results from steering committee meeting)

| Effect (CTQ | RC | Alt | Possible solutions | Decision by Steering committee |
|---|---|---|---|---|
| Missing documentation | RC1 | 1 | Add document status “missing formalities” in SAP. | Approved to start |
| | RC2 | 2<br>3 | a) Inform all managers and teams in Projects about existing process and procedures.<br>b) Include this in onboarding training. | Approved to start<br>Approved to start |
| | RC3 | - | Same as for RC2 (must be coordinated). | Approved to start |
| NCR closing time | RC4 | 4 | Wait 72 hours at GR (Warehouse) before missing doc NCR is created. | Approved to start |
| | RC5 | 5<br>6 | a) Revise and update IRN process.<br>b) Update T&Cs and inform all suppliers. | Approved to start<br>**Hold** – Discuss with Head of SCM |
| | RC6 | 7<br>8 | a) Revise and update workflow in SAP.<br>b) Appoint NCR contacts in Engineering and Planning. | Approved to start<br>Approved to start |
| Temporary Release | RC7 | - | Coordinate with RC2 a and b. | Approved to start |
| | RC8 | 9<br>10 | a) Revise and update process.<br>b) Train Document Centre and Purchasers in new process. | Approved to start<br>Approved to start |
| | RC9 | - | Coordinate with RC2 a and b. | Approved to start |

# Improvement project | Reducing «Missing documentation» when receiving goods

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1. Executive summary
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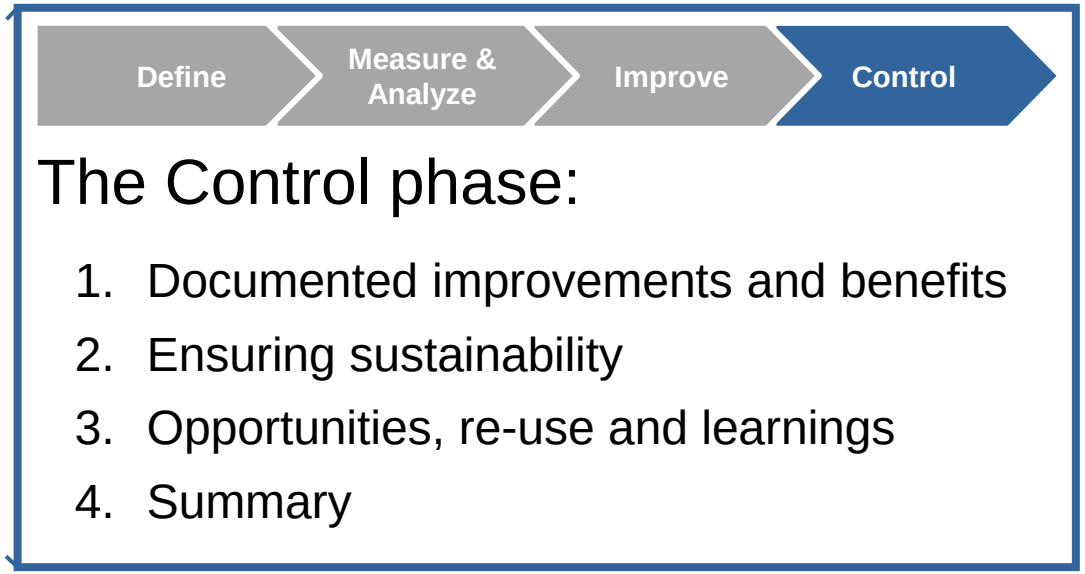
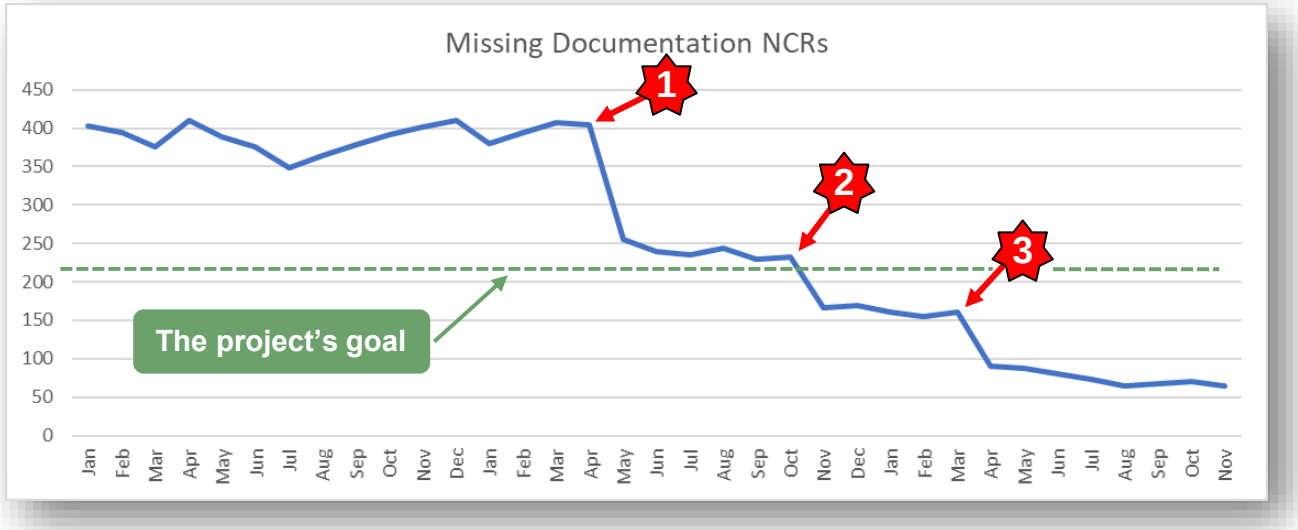


# Control | Development of “Missing Document NCRs”: Improvements

Documented improvements during the improvement project:

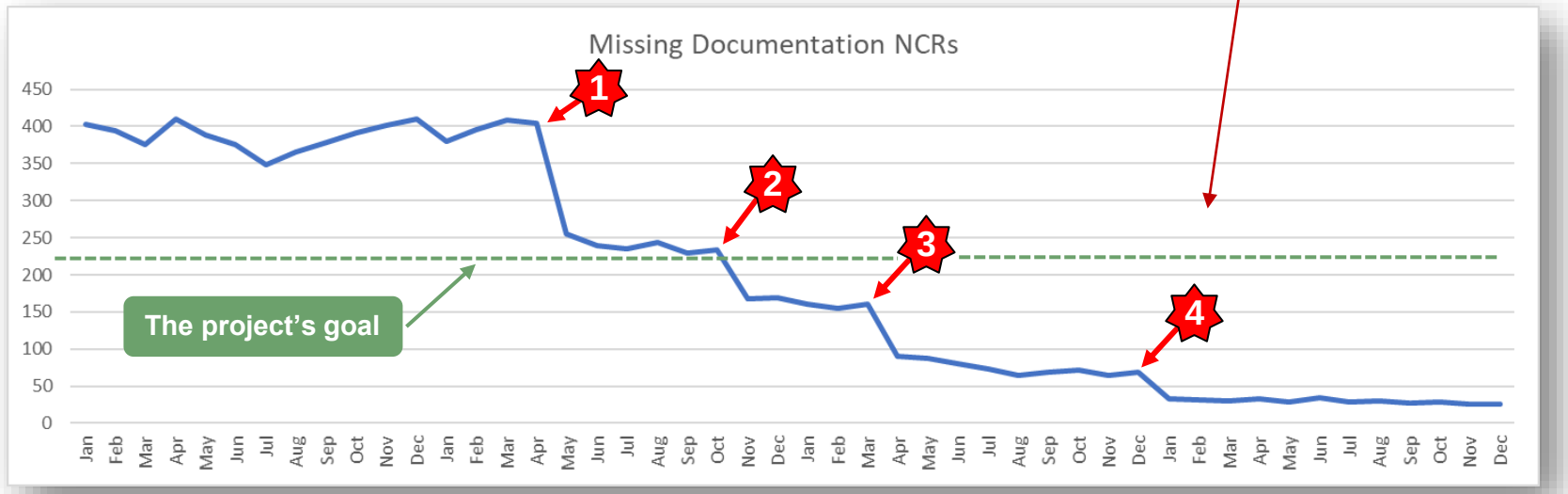
Reducing the number of “Missing documentation NCRs”.




Implemented solutions:

1. 72-hours grace period
2. Update SAP and workflow
3. Conduct training, revising process and T&Cs
4. *Kaizen Workshop after project closure; Minor changes to the process*

Updated 12 months after closing the improvement project:



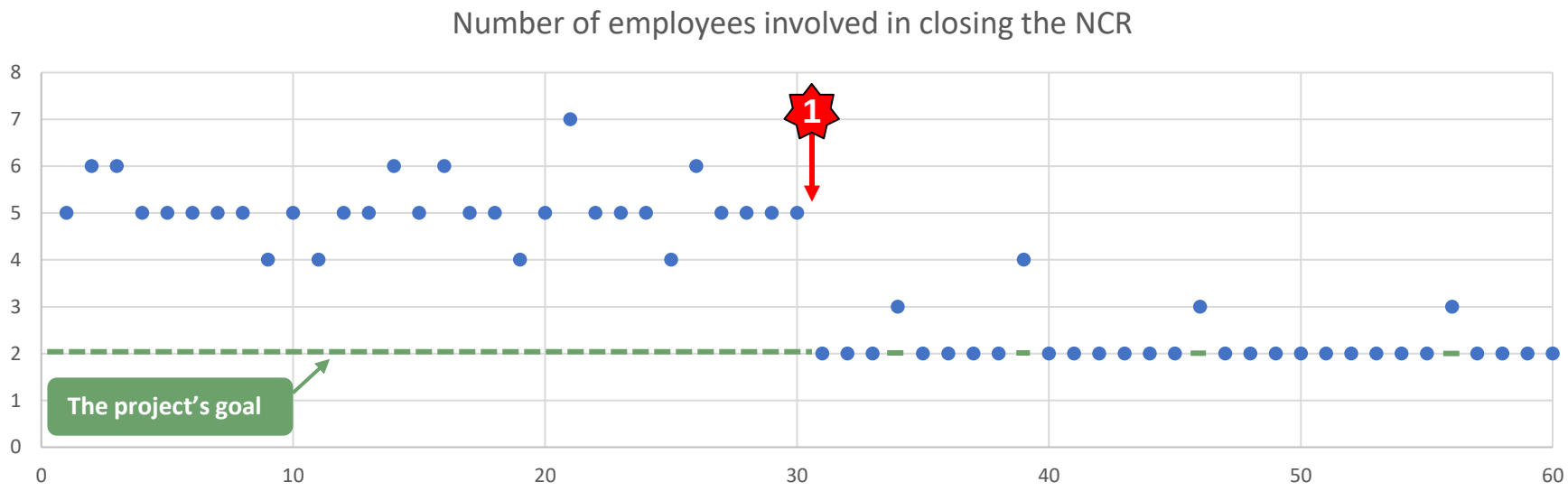
# Control | Development of “Missing Document NCRs”: Improvements

Documented improvements during the improvement project:

Reducing number of employees involved in closing the NCRs.

Implemented solutions:

1. Process changed, NCR handling role clarified, defined users with clear role, SAP workflow changed, and training given. Average reduced from 5,1 to 2,1.



# Control | Development of “Missing Document NCRs”: Sustain

Measures taken to ensure sustainability:

- Global process QA-2000045634 updated by Global Process Manager.
- Global DM procedure 10000222919 updated to reflect DTS 2.0.
- All POs sent in DTS (and not on e-mail) according to new process.
- SAP workflow updated accordingly.
- New document type in SAP for supplier documentation workflow (previously: SUP document on IDC workflow).
- Onboarding training material updated (for Projects, Engineering, Supply Chain, Production and Planning).
- Supplier Status Report updated by Document Management Centre.

Updated Business Case removed

# Control | Development of “Missing Document NCRs”: Future opportunities

Future “internal” opportunities and additional improvements identified:

- QS to approve documentation electronically in DTS.
- Only IRN are stamped and signed.
- Challenges:
  - Make sure that QS is actually doing the FI at the supplier and not at home (therefore signature and stamp on IRN).
  - Implement electronically signature (ref. QS globally and latest project; stamp on all pages in the MRB).
- Electronically administrative check on documents in SAP – skip DM resource on this.
- Looking at a solution for the system to send automatic reminders to the person with the doc in her/his inbox.

Future “external” (outside our business unit) opportunities for the enterprise:

- Implement Product Management for these components (either as a separate organization or in Supply Chain).
- Standardize products and their documentation requirements (simplify/reduce requirements).
- Develop DTS to the next planned 3.0 version which will automate the process further.

# Control | Project evaluation (1 of 3)

## Purpose

- This project evaluation shall be completed when the improvement project is in the closing phase.
- The purpose of this evaluation is to learn from both positive and negative experiences to build a better and disciplined process for executing improvement projects.

## Scope

- This project evaluation covers the following areas:
- Project initiation
- Project execution
- Risk management
- Key deliverables and improvements
- Resources (key personnel, supporting personnel, method, tools and templates)
- Conclusions (improvement ideas to the “Improvement project process”)

# Control | Project evaluation (2 of 3)

## Project initiation:

What worked well:

- The problem clearly communicated to local management
- The problem was clearly understood and quickly acted upon
- Lean coach immediately contacted and made available
- Project Manager was immediately found and prioritized to the project

What can be improved:

- Had to struggle a bit to get acceptance to use the financial controller (challenging situation with few resources in the finance department).
- Key personnel in the improvement project lacked knowledge of the improvement process and improvement tools (more training is in general needed).

## Project execution:

What worked well:

- The project methodology (DMAIC was easy to follow and logical to report on)
- Key employees were very supportive and wanted to help
- That the sponsor had to report, worked really well, good follow-up from the sponsor
- The support from the Lean coach was fundamental to the work and progress
- Improvement tools quite easy to use with good explanations

What can be improved:

- The IT-solution for the improvement project's database was difficult to use (an internal SharePoint solution)
- Difficult to communicate to some stakeholders and their units (had the feeling many were too busy to prioritize information about this project in their units).

## Risk management:

What worked well:

- The risk tool we used was well suited for our project and worked well.
- Valuable exercise to repeatedly assess risk and define actions based on identified risk.

What can be improved:

- No suggestions.

# Control | Project evaluation (3 of 3)

## Key deliverables:

What worked well:

- Goals achieved wrt identified CTQs:
  - Number of NCRs reduced
  - Number of employees involved in the process also reduced
  - Estimated financial benefits according to goal
- Support from stakeholders that was affected was very good.
- Support from the Steering committee and their active communication to other managers was important.

What can be improved:

- The improvement project was estimated to use 6-7 months. The project lasted in 13 months. This was however difficult to estimate/foresee at startup (as we didn't know what we didn't know).

## Resources:

What worked well:

- Support from sponsor and her reporting to the steering committee.
- Prioritization form management of key personnel.
- Support from corporate Lean Office and the Lean coach.
- Dialogue with IT resources.
- Making changes in SAP.

What can be improved:

- The central IT-solution for the improvement project's database.
- Difficult to communicate to stakeholders and their units (had the feeling many were too busy to prioritize information about this project in their units).
- The enterprise is lacking structures for Product Management and standardization of products including documentation requirements.

## CONCLUSIONS:

- The improvement project was successful and reach the project's goals.
- The methodology (and tools and templates) worked very well and managed to solve a challenging and difficult problem.
- The project lasted 6 months longer than planned (but this was accepted by sponsor and steering committee).
- More employees should participate in this type of improvement project and improve their knowledge about systematic problem solving.

# Improvement project | Reducing «Missing documentation» when receiving goods

## Content of this Storyboard:

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4. Appendix: Detailed analysis

Define | Measure & Analyze | Improve | Control

### Appendix: Detailed analysis:

1. Data analysis
2. Process analysis
3. 5 Whys
4. Monitored results - details

Removed